

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

UMI[®]

**Effects of Analytical Review Results, Optimism
and Patterns-for-Coping on Audit Effort
of Accounting Estimates**

Ibrahim H. Balkir

**A Thesis
in
The Faculty
of
Commerce and Administration**

**Presented in Partial Fulfilment of the Requirements
for the Degree of Doctor of Philosophy at
Concordia University
Montreal, Quebec, Canada**

August 2000

© Ibrahim H. Balkir, 2000



National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-54388-9

Canada

Abstract

Effects of Analytical Review Results, Optimism, and Patterns-for-Coping on Audit Effort of Accounting Estimates

Ibrahim H. Balkir
Concordia University, 2000

The primary purpose of this dissertation is to investigate the effect of analytical review results on auditors' effort of auditing accounting estimates. Other objectives involve examining the moderating effect of personality traits (optimism), patterns-for-coping (vigilance), and level of experience on auditors' effort of auditing accounting estimates. In examining the effects of optimism and vigilance on auditing accounting estimates, the study makes a significant original contribution to the extant literature in audit judgement.

The subjects were public accountants at different levels from both Big Six as well as non-Big Six firms. The findings of the study indicate that auditors' perceptions to extend tests of details related to the balances of the accounting estimates, according to the audit hours allocated to the budgeted time plan, did vary significantly across treatment groups. The analytical review results and the two dimensions of the individual psychological differences influenced their confidence in their assignment of the audit effort. Analytical review results were found to affect the audit plan for accounting estimates when these results signaled fluctuations. However, the conservatism tendency found by previous studies was found to be valid in this study. Optimism dimension was significant in moderating auditors' judgement yet vigilance and experience level were inconclusive in their influence.

Dedication

This work is dedicated to my loving parents,
My father, Ahmed Faraj Balkir, and my mother, Hawwa.
Your sacrifices shall not go in vain.

Acknowledgements

I would like to begin by expressing my sincerest gratitude to the members on my Phase III (dissertation) committee. Dr. Hussein Warsame , Dr. Maureen Sterling and Dr. Jane Criaghead for their interest, advice, and helpful comments throughout this dissertation. For that, I will be forever grateful. I am particularly grateful to Dr. Hussein Warsame who graciously stepped into the breach caused by Dr. Mohamed Ibrahim's departure. Despite his numerous responsibilities, Dr. Warsame was always accessible, encouraging, and caring. Also his outstanding intellectual calibre and enthusiasm for research made him an unending source of ideas, advice, and guidance. Very special thanks are due to Dr. Mohamed Ibrahim who set me on the path of research in auditing judgement and decision making, and was unfailingly patient, helpful, and supportive.

The Ph.D. program at Concordia has been especially helpful. Ricky de Brentani, the associate dean when I started, took a chance with me, for which I will always be thankful. Heather Thomson deserves my thanks and praise. She is a treasure to the program, and much appreciated by the Ph.D. students. Theresa Sarazin-Wadey also deserves my appreciation for her help and kindness.

I want to acknowledge the help and support of my colleague Ali Danishfar. His friendship meant much to me.

My heartfelt gratitude to my loving family. My wife Afaf was my constant source of strength, inspiration, and encouragement. It was she who inspired me to set out on this long journey, and she has been with me every step of the way. Our children, Ahmed, Anass and Nuran also deserve my thanks as their lives were disrupted.

Table of Contents

LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF APPENDICES	x
CHAPTER I	1
1.0 Overview	
1.1 Motivation of the Study	
1.2 Professional Judgement in an Audit Task Environment	
1.2.1 Importance of Professional Judgement	
1.2.2 Nature of Audit Judgement	
1.3 Accounting Estimates	
1.4 Analytical Review Procedures	
1.5 Individual Psychological Differences	
1.5.1 Optimism	
1.5.2 Patterns of Coping	
1.6 Contribution to Original Knowledge	
1.7 Organization of the Dissertation	
CHAPTER II	14
2.0 Overview	
2.1 Audit Judgement Research	
2.2 Accounting Estimates	
2.3 Analytical Review Procedures	
2.4 Individual Psychological Differences	
2.4.1 Optimism (personality dimension)	
2.4.2 Patterns-for-Coping	
2.5 Effects of Experience	
CHAPTER III	39
3.0 Overview	
3.1 Inferential Rules	
3.2 Mental Models and Rule Systems	
3.3 The Combined Concept of the Model	
3.3.1 Analytical Procedures for Auditing Accounting Estimates	
3.3.2 The Moderating Effect of Individual Differences	
3.3.3 Experience Effect	
CHAPTER IV	57
4.0 Overview	
4.1 Research Questions	
4.2 Usefulness of Analytical Review Results	
4.2.1 Hypothesis 1: Analytical review results and audit effort	
4.2.2 Hypothesis 2: Analytical review results and conservatism	

4.3	Moderating Effect of Psychological Individual Differences	
4.3.1	Hypothesis 3: Optimism and audit effort	
4.3.2	Hypothesis 4: Patterns-for-coping and audit effort	
4.4	Experience Effect	
4.4.1	Hypothesis 5: Experience effect and audit effort	
CHAPTER V		67
5.0	Overview	
5.1	The Case	
5.2	The Accounting Estimates Notes	
5.3	Pre-test Procedures	
5.4	Subjects	
5.5	Administration	
5.6	The Task	
5.7	The Variables	
5.7.1	Independent Variable (Analytical Review Results)	
5.7.2	Moderating Variables	
5.7.2.1	Optimism	
5.7.2.2	Patterns-for-Coping (Vigilance)	
5.7.3	Experience Impact	
5.7.4	Dependent Variable (Planned Audit Hours)	
5.8	Analysis	
CHAPTER VI		79
6.0	Overview	
6.1	Statistical Analysis	
6.2	Tests of Hypotheses	
6.3	The Interaction Effect	
6.4	Correlation Matrix	
CHAPTER VII		96
7.0	Overview	
7.1	Conclusions	
7.2	Limitations of the Study	
7.3	Suggestions for Future Research	
REFERENCES		105
APPENDICES		115

List of Figures

1. The Relationship Between Personality, Cognitive Complexity,
Accounting Information, and Audit Judgement 47

List of Tables

Table #	Brief Description	Page
1.	The minimum categories of common ratio classification	51
2.	Descriptive statistics for the two treatment groups	81
3.	Distribution of participants according to experience and gender.....	82
4.	Analysis relating to H1 and H2	84
5.	Analysis relating to H3	85
6.	Analysis relating to H3 (continued)	86
7.	Analysis relating to H4	87
8.	Analysis relating to H4 (continued)	89
9.	Analysis relating to H5	91
10.	Analysis relating to H5 (continued)	91
11.	Analysis relating to the interaction for optimism and vigilance	93
12.	Analysis relating to the interaction (continued)	93
13.	Correlation matrix	95

List of Appendices

1. Analytical Review Results Signalling No-Fluctuations	115
2. Analytical Review Results Signalling Fluctuations	125

CHAPTER I

INTRODUCTION

1.0 Overview

The purpose of this dissertation is to investigate the effect of analytical review results on audit effort to examine accounting estimates. In addition, the dissertation seeks to examine the moderating effects of the individual psychological differences (optimism and patterns-for-coping) on judging the budgeted time plan for auditing accounting estimates. The role of experience is considered in this context. The perspective that has been used for discussing the process involved in the audit judgement of this study is the cognitive theory of induction outlined by Holland et al. (1986). This inductive-inference theory is based on the premise that people reason by manipulating selected goals and knowledge within the framework of a mental model. It is hypothesized that optimistic, vigilant auditors are expected to use analytical review results effectively to judge the reasonableness of accounting estimates. The results of the study indicate that analytical review results affect the audit plan for accounting estimates when these results signalled fluctuations. In addition, an optimism trait moderates auditors' judgement in the context of accounting estimates. Yet, the evidence that factors of vigilance and experience influence judgement is inconclusive. This chapter presents the motivation of the study and a brief description of the main concepts of the study as well as the original contribution to knowledge.

1.1 Motivation of the Study

Research in audit judgement continues to demand more attention particularly in terms of variables that should be included in testing the audit judgement process (Anderson et al. 1991, pp. 43-44). The primary focus of attention in professional judgement is on how well these judgements are made (Dowie and Elstein, 1988). The Canadian Institute of Chartered Accountants (CICA) Research Report (1995) indicated that professional judgement can be influenced by several key factors including the audit task environment and auditors' characteristics. Thus there is a need to pay close attention to the effects of these variables on audit judgement.

Inasmuch as accounting estimates pervade financial statements, professional audit judgement is fundamental. This is because accounting estimates provide fertile ground for misstating financial information, and misstatements can be difficult to detect. The recent promulgations of Section 5305 (CICA 1996) and SAS No. 57 (AICPA, 1988), which are devoted exclusively to accounting estimates, provide further evidence about the growing importance of this audit area. SAS No. 57 illustrates the pervasiveness of future events and provides forty examples of where accounting estimates are required in part because "the measurement of some amounts or the valuation of some item is uncertain, pending the outcome of future events" (Beaver, 1991). A number of studies have furnished the literature with the sensitivity of accounting estimates (e.g., Hylas and Ashton, 1982; Kaplan and Reckers, 1995). Inasmuch as these assertions deal with the difficulty of the measurement, verification and auditing, it is worthwhile to consider supplementary techniques for investigating them.

Analytical procedures are used in the planning stage of the audit to help determine the nature, timing and extent of substantive procedures. These procedures should enhance the auditor's understanding of the client's business and the events and transactions that have taken place since the previous audit. They also should help identify audit areas of higher risk. As noted by Kinney and Haynes (1990) and others (e.g., Blocher and Loebbecke, 1993), research should continue to focus on the question of how effective analytical procedures are in various contexts. They noted that while we have learned a good deal from recent research in this regard, we have far from a full understanding of the effectiveness of analytical procedures. Thus, an investigation of the effectiveness of analytical review results as a gauge for judging the accounting estimates would make a valuable contribution.

As noted above, the CICA reported that professional judgement can be influenced by several factors, among them are the auditors' characteristics. The auditor, as the person exercising judgement, is an important part of the professional judgement/decision process. As Gibbins and Mason argue (1988, p.18), "Considering people as part of and influences on the process is obvious: judgement is a human process, with logical, psychological, social, legal and even political overtones." However, prior accounting research provides little empirical evidence concerning the impact of individual differences on auditors' professional judgement. Echoing criticisms voiced in earlier reviews of the literature (e.g., Libby, 1981; Ashton, 1982; Gibbins and Mason, 1988; Pincus, 1990), they argue that the lack of evidence concerning the impact of people on professional judgement is, at least in part, due to research designs which fail to capture the complexity of the professional judgement process.

This study is motivated primarily by the objective of making a significant original contribution to the extant literature. It does so through an investigation of the effects of

individual psychological differences (optimism and patterns-for-coping), and experience level, as well as analytical review results on auditor judgement. These factors are examined in the context of an ill-structured setting, auditing accounting estimates.

1.2 Professional Judgement in an Audit Task Environment

1.2.1 Importance of Professional Judgement

Abbott wrote of the extensive influence of professionals in our lives: “They heal our bodies, measure our profits, save our souls” (1988, p.1). Modern society continues to become more dependent on the judgements of professionals such as lawyers, physicians, and accountants. This increased dependence appears to be a natural consequence of both the general expansion of human knowledge and the efficiencies that arise from specialization.

Judgement is the process of making a choice, a decision, leading to action. This is a simple statement, but the judgement process is likely to be an extensive one. Conceptually it includes initial perception and identification of issues, search for and assembly of information, evaluation and weighing of information and of prior knowledge, consideration of the value or utility of potential outcomes and the decision itself (Gibbins and Mason, 1988, p. 4). Both the wealth of domain-specific knowledge that the professional brings to the judgement task, and the existence of high stakes in many judgement settings, characterize professional judgements.

The audit environment, like other professional settings, requires that the professional bring to the task a substantial amount of domain-specific knowledge. Inasmuch as auditors are faced with the task of formulating opinions about the fairness of their clients' financial statements, they must employ many different types of domain-specific knowledge when

conducting their work. For instance, auditors must have knowledge of professional audit standards to plan and perform the audit work, and an understanding of the client's business. In doing so, they use their professional judgement to determine the type and amount of information to collect, the timing and manner of collecting it, and the implications of the information collected (Joyce and Biddle; 1981, p. 120). This study does cast some light on one of the variables that represents domain-specific knowledge which may affect audit judgement in the environment of ill-structured tasks, and also on the moderating element of individual psychological differences of this judgement. However, literature on audit judgement is still in need of paying more attention to the factors that affect and direct this judgement.

1.2.2 Nature of Audit Judgement

Professional judgement takes place in the context of professional standards that reflect the collective judgements of the profession. By communicating the experience of the profession, the standards support the exercise of judgement by the auditor. For example, one of the main characteristics of the audit environment is risk analysis. The audit profession's risk-analysis approach to auditing posits that audit risk is a function of three component risks: inherent risk, control risk, and detection risk. Establishing audit risk is a straightforward judgement, as professional standards require that it be set at a relatively low level. The assessments of inherent and control risk must be made (Anderson et al., 1991, p. 47), and then these assessments are combined with the desired level of audit risk for determining the maximally acceptable level of the remaining risk, detection risk.

In developing the definition of the professional judgement, the CICA (1995, p. 5) reported that such professional judgement is likely to be most valuable in complex, ill-defined, or dynamic situations. This is especially so where standards are incomplete, and should normally involve consultation with knowledgeable people, identification of potential consequences and documentation of the analytical processes leading to the decision. The above definition describes the circumstances where professional judgement would be most valuable depending, to a large extent, on the nature and complexity of the problem at hand. As a result, the last few years have seen quite a dramatic increase in investigations into the audit judgement process as researchers, legislators and auditors alike seek to cast light on this little-understood but absolutely crucial activity. In the context of the above definition and consistent with the ongoing investigations, this dissertation explores the audit judgement of accounting estimates as a complex and ill-defined task.

1.3 Accounting Estimates

Value and hence income, which are future-oriented concepts (Wallace, 1993) are uncertain and fraught with risk. Markets are imperfect, and they are also incomplete. Human decision making processes (for which accounting valuations are the input) are of an almost infinite variety, complexity, and variability. In most and perhaps all cases, they are imperfectly understood even by the people who use them (Stamp, 1981). This is often the status of accounting estimates, which represent a complex area for both the preparer and the auditor. Thus, accounting information becomes accounting estimates (subjective) when it is based on the intended actions of management, on some other future event, or on

management's judgement and as such, cannot be corroborated easily through objective sources.

The client is responsible for making assumptions about future events or other judgements that relate to accounting estimates. The auditor is responsible for assessing the audit evidence supporting the accounting estimates and drawing a conclusion as to whether management's estimates and assumptions are reasonably supported. The auditor is not responsible for making the estimate. Hence, the overall audit objective is to obtain evidence to support the opinion on financial statements. One of the keys to obtaining evidence in support of accounting estimates is to identify the issues early in the audit. In this regard, the auditor focuses his/her planning efforts on high-risk areas. Because their subjective nature makes them susceptible to misstatement, estimates are generally a high-risk area. But some estimates are less risky than others.

Since accounting estimates are future-oriented, the audit evidence available to support these estimates is qualitatively different than the evidence from past transactions (how can the auditor confirm the terms of a transaction that may take place in the future?). Auditors often speak of being "comfortable" with certain amounts or disclosures included in the financial statements. In general, audit "comfort" comes from the process of gathering and assessing audit evidence. When working with such estimates, the auditor is required to look to two sources that provide him/her with "comfort." These are the processes used to develop these estimates, and the quality of any assumptions (Ramos and Delahanty, 1998).

Canadian professional auditing literature defines an accounting estimate as "the amount included in financial statements to approximate the effect of past business transactions or events or the present status of an asset or liability"(CICA, 1996, para. 2).

Estimates are among financial statement assertions, which are more vulnerable to management manipulations and biases. They may also be open to deliberate misstatements. Hence, care must be taken in both assessing risk and auditing. Misstatements are frequently caused by overly optimistic accounting estimates that can be detected through the use of analytical procedures (Callahan et al., 1988, p. 56). Building on the above mentioned importance of accounting estimates and on the rapidly growing concern of this audit area as well as the small amount of research attention which has been given to auditors' reporting decisions for accounting estimates, additional research on this topic appears warranted.

1.4 Analytical Review Procedures

Section 5301 (CICA, 1996) considers that analytical procedures are an important part of the audit process and consist of evaluations of financial information made by a study of plausible relationships among both financial and non-financial data. Variations from expected relationships may reflect unusual transactions, accounting or business changes, or misstatements of financial information. Practitioners hope that analytical review can increase the efficiency of audits, since it is thought to be a relatively inexpensive procedure that seems to have considerable power for identifying errors and guiding audits (Hylas and Ashton, 1982; Willingham, 1985; Felix and Kinney, 1982). Arens and Loebbecke (1991, pp. 213-6) argue that analytical review may offer a better understanding of clients and their industries by comparing the current year ratios with those of other businesses in the same industry. They also maintain that analytical review may give an indication of financial difficulty, with certain ratios possibly indicating a high risk of financial failure.

However, the CICA Handbook, paragraphs 5300.30 and 31 on *audit evidence* state that analytical review procedures alone do not normally provide the auditor with sufficient, appropriate audit evidence, even when the auditor considers the system of internal control to be very effective. Nonetheless, they can provide essential evidence on the reliability of financial statements which, when combined with other audit evidence, permits the auditor to report. Thus, on the surface, SAS 57 provides a stronger role for analytical review than the Canadian standards.

While analytical review procedures are applicable to all three major stages in the audit process, Kinney (1981) has suggested that analytical review procedures perform mainly an "attention-directing" function during audit planning and testing. In applying analytical review as an attention-directing tool or as a substantive test, the auditor forms an expectation as to what the unaudited book values should be, based on evidence acquired during analytical review. The unaudited book value is compared to the expectation, and a materiality standard is applied to judge the significance of any difference.

A typical set of financial statements provides the opportunity to compute literally thousands of ratios and to perform other analytical procedures. This knowledge available from analytical review procedures may present the auditor with a perception structure that helps determine whether or not the accounting estimates assertions need additional effort "audit hours." In such a situation, an important research question is: in auditing accounting estimates embodied in financial statements, what effect (if any) do analytical review results have on deciding the amount of audit effort? This study hypothesizes that the hours allocated to testing accounting estimates will be increased when financial statement

fluctuations are present. However, these hours will not be reduced when there are no financial statement fluctuations.

1.5 Individual Psychological Differences

Work environments for those in professional auditing are often quite stressful. The audit environment is itself dynamic. Those whose primary function is to verify and attest the financial statements continually engage in stressful tasks. In fact, in today's environment auditors often confront complex and ill-structured assignments that require performing a professional judgement. Accounting researchers have been interested in the effects of individual psychological differences on decision making. However, this research tends to focus on an understanding of these individual differences among the users of accounting information. One of the objectives of this dissertation is that knowledge of individual differences may be able to guide the planning and performance of audit work. In this context, individual psychological differences involve two related dimensions as suggested by McGhee et al. (1978, p. 681): personality and cognitive complexity, which could interact and act as moderating variables between the receipt of information and resultant judgement.

1.5.1 Optimism (Personality Dimension)

Optimism has been defined as the extent to which people have the generalized expectancy good things will happen (Scheier and Carver, 1985). Seligman (1991) suggests that the central characteristic of optimists is that they view defeats as temporary

setbacks, whereas pessimists believe that negative events will last a long time. Defeats are viewed as challenges for optimists and stimulate greater effort to overcome adversity.

It is assumed that each decision-maker has a unique and stable index of optimism ranging from extreme pessimist to incurable optimist. Variability in behavior across individuals is attributed to their differential subjective weighting of security and aspiration levels. Personality theorists (e.g., Scheier and Carver, 1985, 1987) view optimism as a disposition that remains stable across time, situations, and contexts. Seale et al. (1995) speculated that this general disposition to anticipate and accentuate the positive will carry over to the domain of decisions and will correlate with one's choice of a decision strategy in the absence of information about the probability of the various states.

Auditors have to rely to a greater extent on their professional judgement for ascertaining accounting estimates that require a considerable amount of effort. In this regard, their mental model integrates knowledge in various ways depending on the selected goal (auditing accounting estimates). Because auditors are not identical, there is no reason to expect them to select, evaluate, and use the same set of information for performing their judgmental audit task. Systematic differences among individuals can explain variations in perceptions of risk. The question that may reveal this moderating effect is: in using analytical review results for auditing accounting estimates accounts, what effect (if any) does optimism have on judging the amount of audit effort?

1.5.2 Patterns-for-Coping

The term coping refers to the responses made by an individual to a situation with a potential harmful outcome. Cohen and Lazarus (1979) have offered a more formal definition of coping. They defined coping as an “effort, both action oriented and intrapsychic (mental and emotional reactions), to manage environmental and internal demands and conflicts which tax or exceed a person’s resources.” Therefore, the general style of coping is to assume that when people are presented with an unstructured stimulus and are asked to complete it or make sense out of it, they will do so in a way that reveals their underlying cognitive complexity. People who reveal a relatively low capacity to deal with the details emanating from a company’s reports or financial information take steps to buffer themselves from the information, or channel it to someone else. On the other hand, individuals who have a vigilant information-processing attribute are likely to have a relatively high capacity to deal with the accessible information.

The process of auditing accounting estimates portrays a complex goal, which brings into play the cognitive processes. Therefore, the other question of this study concerns the notion that patterns-for-coping (cognitive complexity) have an effect on the use of analytical review results by auditors. More specifically, in using analytical review results for auditing accounting estimates, what effect (if any) do patterns-for-coping have on judging the amount of audit effort?

1.6 Contribution to Original Knowledge

The main purpose of this study is to provide evidence on the relationship between analytical review results and auditor's effort to audit accounting estimates. The main area

that this dissertation is contributing to is the area of reporting decisions with respect to accounting estimates. The study, however, has been undertaken to make a number of contributions. First, while the matter of auditing of accounting estimates has been addressed by a few studies (e.g. Callahan et al., 1988; Wallace, 1993; Kaplan and Reckers, 1995), the issue of audit evidence for accounting estimates represents an area requiring additional research. This study seeks to examine whether the presence of financial statement errors provides the auditor with a gauge for judging the accounting estimates accounts. Thus, the study contributes to the understanding of the effectiveness and productiveness of analytical procedures. Second, since the errors in judgement are important because of their potential impact on program planning decisions (Asare and Davidson, 1995), it is valuable for the practitioners to know which factors to consider in planning their audit of accounting estimates. Finally, the effects of personalities and cognitive complexity on audit judgement need considerable research, therefore, this study seeks to make a substantial contribution to the extant literature through examining the moderating effect of optimism and patterns-for-coping on audit judgement.

1.7 Organization of the Dissertation

The remainder of this dissertation is organized as follows. Chapter II presents a review of the literature. Chapter III highlights the theoretical framework. Chapter IV incorporates the research hypotheses. The research methodology employed is described in chapter V. Chapter VI introduces the results of the data analysis. Chapter VII of the dissertation presents conclusions, the limitations of the study, and implications for future research.

CHAPTER II

REVIEW OF ACADEMIC LITERATURE

2.0 Overview

The objective of this chapter is to present the existing research for the areas of audit judgement, analytical review procedures, accounting estimates, and individual differences. Historically, with respect to audit judgement research, the manner in which the auditor makes these various judgements was not a subject widely discussed. It was considered simply a matter of professional judgement gained by years of training and experience. However, in the last twenty five years, a significant amount of systematic research has appeared that has aided policy makers and accounting firms in their deliberations on the formulation of audit policies and procedures. This literature is usually described as audit judgement/decision-making research or human information processing research in auditing. The aim of this research has been to describe actual behaviour, assess judgement performance, and test theories of cognitive processes that produce the judgements and decisions.

Performing analytical procedures to obtain audit evidence has long been a common practice. Early research raised questions about the ability of analytical procedures to generate estimates sufficiently precise to allow accurate conclusions about an account balance, in light of materiality levels for an engagement. The attention was directed mainly

at developing means of integrating various statistical tools into the process of analytical review. As the feasibility of using analytical procedures became clearer, researcher and practitioner attention gradually shifted to the proper approach to performing such procedures and improved techniques that could be used by auditors. Recently, research has focused on auditors' ability to use these tools effectively. Therefore, the attention to analytical procedures has been increasingly recognized as potentially powerful, efficient, necessary, and capable of being enhanced through various decision-support tools.

The formulation of accounting estimates has been the subject of a wide array of academic research articles. However, a gap in the literature became apparent mainly that dealing with the audit of estimates. Although it was recognized that soft numbers permeated financial statements and that estimates were an integral part of every set of financial statements, the research did not address generously the audit implications of accounting estimates.

In addition, this study reflects on the literature of the issues of experience and individual psychological differences (optimism and patterns-for-coping) to grasp their link to the issue of using analytical review results in judging the reasonableness of accounting estimates.

2.1 Audit Judgement Research

For some time now, professional and academic audit literature has recognized the importance and pervasiveness of judgement in auditing. In fact, the exercise of professional judgement is seen as one of the hallmarks of the auditing profession, and it is unlikely that any auditor would dispute the central role that judgement plays in auditing. The ultimate

goal of human information processing research in auditing is to improve audit decision making (Ashton, 1983, p. 7). Before decision making can be improved, however, the current quality of decision making must be evaluated, and before decision making can be evaluated, decision making must be understood. The early studies (1970s and 1980s) examined audit judgement focused on evaluating the quality of audit judgement. Other characteristics examined included the consistency in the auditor's judgements over time, the auditor's confidence in his or her judgements, and the auditor's self-insight in terms of the perceived emphasis given to various information inputs versus the actual weight placed on the inputs. These studies also examined auditor cue usage.

Ashton (1974) examined auditors' internal control judgements over payroll. The subjects responded to a series of cases, consisting of different responses to the same six internal control questions (e.g., "The tasks of timekeeping and payment are adequately segregated from the task of payroll preparation") by rating the strength of internal control in each case. Consistent with the conventional wisdom, auditors placed greatest significance on the segregation of duties cues. Ashton also found the extent of consensus between auditor judgements on the strength that the internal control systems were relatively high compared to the consensus found in studies of other types of expert judges, for example, stockbrokers and radiologists. His findings were also inconsistent with some earlier auditing studies (for example, Aly and Duboff 1971).

Joyce (1976) extended Ashton's study by examining the hours planned for substantive testing. Joyce also used a series of cases to manipulate internal control characteristics, but she examined the accounts receivable area rather than the payroll area. Joyce found a lack of consistency across auditors' program planning judgements and that

they had considerably lower self-insight than did Ashton's subjects. Joyce suggests that while auditors may agree on the evaluation of internal control, they may disagree on "how to incorporate that evaluation in a judgement of what audit work to plan and perform" (Joyce 1976, p. 53).

The Ashton (1974) and Joyce (1976) studies have been replicated and extended by subsequent research. Trotman and Wood (1991) identify seventeen studies that examine consensus in internal control judgements. Overall, the results show higher mean consensus than typically reported in non-auditing studies. However, there is considerable variation in consensus between studies. Interestingly, Trotman and Wood do not find any evidence that these differences can be explained by moderator variables, including auditor experience, type of internal control system, and length of internal control questionnaire.

More generally, Solomon and Shields (1994) review twenty-eight studies that model auditor judgements. They conclude that, with only a few exceptions, the results of the auditing studies are consistent with non-auditing studies. The primary result is that, at best, auditors only exhibit moderate levels of consensus. These results are consistent with Mautz's (1975) earlier concern over the lack of consistency that may exist in audit practice. The results suggest that there is scope for improvement in audit judgement and, thereby, audit practice.

Following the lead in psychology, another body of audit judgement research has attempted to understand more about the process by which audit judgement occurs. Although early audit judgement research did not investigate the processes leading to judgements, studies using process-tracing methodologies (e.g., Biggs and Mock, 1983) provided evidence that information search and decision process could be important determinants of

auditor judgement. Earlier research in psychology had identified information-processing constraints, such as information overload, as important factors in performance.

An attempt to synthesize an account of the psychological processes by which auditors bring experience to bear in reaching judgements was made by Gibbins (1984). He concluded that the professional accountant “probably does not consciously analyze situations as much as s/he would like, probably does not look ahead and anticipate problems as much as s/he would like, and probably is more defensive and justification-oriented than s/he would like to be.” Faced with limited information-processing abilities to deal with complex tasks, decision-makers have two broad coping strategies. The first is the selective use of information. Typically, attributes of available evidence are not given sufficient attention. For example, auditors may focus on characteristics of the evidence that are representative of the population characteristic of interest (e.g., deviation rates), while ignoring other relevant characteristics (e.g., sample sizes). The second strategy is to simplify the task. This can take many forms, including the use of rules of thumb to eliminate alternatives from consideration. Other methods are the use of availability, representativeness, and anchoring and adjustment strategies.

The availability heuristic is used whenever a decision-maker estimates frequency or probability of an item or occurrence of that item, in terms of how easy it is to think of previous examples. Auditors often use the availability heuristic, because they tend to rely on their personal experiences and expertise in making decisions. For example, auditors use the availability heuristic when they assess the probability of client management deliberately misrepresenting financial information, based on the ease with which the auditor can recall misrepresentation of information in the past.

Representativeness involves judging the likelihood of an event by the degree to which its characteristics are representative of (i.e., similar to) the characteristics of the population of interest. Uecker and Kinney (1977) is one of the earliest studies in this area. They had auditors examine three pairs of sample results, invoking different sample sizes and error rates. Auditors selected the sample providing the stronger evidence that the population deviation rate was not greater than 5 percent. By design, the stronger evidence was the sample with the larger deviation rate, but larger (more reliable) sample size. Use of the representativeness heuristic, however, would lead to selection of the (less reliable) sample with the smaller deviation rate, since this characteristic is representative of the population characteristic of interest.

The auditors performed better than subjects in similar psychology studies with 70 percent of auditor judgements being correct. However, 54 percent of subjects made at least one judgement consistent with the representativeness heuristic. Subsequent research (Joyce and Biddle, 1981b and Rebele et al., 1988) has examined auditors' sensitivity to the reliability of the source of the evidence. Overall, in contrast to nonauditing studies, this research finds that auditors are relatively sensitive to the reliability of information source.

A commonly used judgement shortcut is anchoring and adjustment. This occurs when a judgement is made by anchoring on a value and adjusting to allow for the circumstances in the present case. The problem with this strategy is that the outcome is highly dependent on the information available or the way the information is presented. Adjustment from this anchor is typically insufficient. The relevant auditing studies report mixed results. For example, Joyce and Biddle (1981a) find that auditors insufficiently

adjusted from an irrelevant anchor. On the other hand, Butler (1986) reports that, while students anchored on information provided by the researcher, auditors established their own anchor. Recent research has employed Hogarth and Einhorn's (1992) belief-adjustment model, which assumes that belief adjustment follows an anchoring and adjustment process. The model is particularly relevant to auditing because it recognizes the sequential nature in which information may be received. Using this model as a framework, several studies (Ashton and Ashton, 1988; Tubbs et al., 1990) have found that auditors place more weight on evidence received most recently. That is, the researchers observed a recency effect when auditors revise their beliefs based on sequences of positive and negative evidence. This is a common finding in psychology (Hogarth and Einhorn, 1992). Such an effect has major implications for audit practice, since this suggests that the order in which auditors receive and evaluate evidence may have a substantial impact on decision making. That is, two auditors may receive exactly the same evidence but in varying order and subsequently arrive at different conclusions, thus potentially reducing audit effectiveness or efficiency. However, environmental factors and audit task may moderate recency effects (Messier and Tubbs, 1994 and Kennedy, 1993).

Biases may occur not only in processing information but also in the search for information. Several studies (for example, Kida 1984) have investigated the evidence-search strategies used by auditors. Auditors often explicitly or implicitly formulate hypotheses to explain certain factors (for example, a change in key ratios during preliminary analytical review) and then search for evidence to test the hypothesis. Kida (1984) examined whether the hypothesis-testing strategies employed by auditors affect their search for data. Kida noted that audit tasks require auditors to sift through a number of pieces of information,

some of which can provide confirming evidence and some, disconfirming. The overwhelming conclusion from the psychology literature is that individuals preferentially collect evidence that tends to confirm rather than disconfirm their hypothesis. Kida suggested that if auditors employ confirmatory strategies, the final decisions will depend to some extent on the initial framing of the hypothesis. Although Kida found limited support for the existence of confirmatory strategies, the effect was less powerful than found in many psychological studies. Subsequent research (Smith and Kida, 1991) provided very little confirmation of the presence of confirmatory strategies in the information search and recall process of auditors. The results of these studies suggest that the pervasive, overriding concern by auditors for negative outcomes (that is, conservatism) may have nullified or precluded the use of confirmatory strategies (Smith and Kida, 1991).

Over the last decade, a dramatic enhancement of our understanding of the role of knowledge and memory as determinants of audit judgement performance has taken place. In particular, studies have examined knowledge differences between auditors with different levels of experience and expertise and, more recently, how knowledge differences relate to differences in auditor performance (Libby and Luft, 1993; Bonner and Pennington, 1991). These studies can provide some of the information necessary to answer a variety of practical questions. Most of the past research in this field has been part of a model-building process. We have learned about knowledge storage and retrieval by auditors of different experience levels and, to a lesser degree, how these knowledge differences affect performance. In short, this area of research is seen as important for its long-term practical implications for expert systems, training, and staff allocation, but direct practical implications await further research.

2.2 Accounting Estimates

Wallace (1993) emphasized the nature of the process of accounting estimates. She noted that it is difficult for a company to apply traditional accounting controls, and consequently it is difficult for the auditor to apply traditional audit tests and procedures. A number of studies have furnished the literature with the sensitivity and the auditing of accounting estimates. For instance, Hylas and Ashton (1982) reported an empirical study of 281 errors requiring financial statement adjustments on 152 audits. Among other things they reported the audit areas in which the errors occurred. They found that approximately 15 percent of the financial statement adjustments in their sample related to accounting estimates. On the basis of interviews conducted by Wallace (1993) with both drafters of Statement on Auditing Standards No. 57 (AICPA, 1988), and members of the practice community, the pronouncement is principally a codification of existing practice. It plugged a hole in the literature but had little perceptible influence on practice other than increased attention on a category of accounts, information flows, and accounting processes over less routine, but more than one-time transactions. Smith (1994) challenged the traditional notions about what constitutes sufficient appropriate audit evidence. She argues that since the primary source of evidence for soft information is enquiry of management, one option for auditors is to determine whether they can change how enquiries are carried out so they can obtain more persuasive evidence. One way would be to corroborate the enquiry by making further enquiries from other appropriate sources within the entity. Consistent responses from different sources provide an increased degree of assurance. Callahan et al. (1988) suggest that the interplay of SAS No. 57 "*Auditing Accounting Estimates*" with SAS No. 56

"Analytical Review Procedures" could improve the auditor's effectiveness in detecting misstatements. In addition, the AICPA Technical Issues Committee of the Private Companies Practice Section has requested for guidance in the area of auditing accounting estimates. Ramos and Delahanty (1998) have responded by providing the practitioners with guidance for handling the audit problems related to the audit of soft accounting information, including how SAS No. 57, *Auditing Accounting Estimates*, may be applied in practice.

However, little research attention has been given to auditors' reporting decisions for accounting estimates. Kaplan and Reckers (1995) investigated the influence of three environmental red flags - "management lifestyle, bonus compensation programmes, and internal audit departments' strength"-on auditors' accounting estimates actions. The subjects were of two different ranks, manager and senior. They concluded that the assessments of management's intentions influence reporting decisions with respect to accounting estimates. Additional research on this topic appears warranted because of the potential critical nature and relatively unique problems accounting estimates pose to the auditor.

2.3 Analytical Review Results

Analytical review has received significant attention in the auditing literature. The research attention has been directed at three different sectors of developing analytical review. The first sector of research is an attempt to understand the way analytical procedures are used in practice, and how they should be used. This research is to promote the understanding of the nature of analytical procedures and how they are or can be used in practice. Papers by Daroca and Holder (1985), Tabor and Willis (1985), Ameen and Strawser (1994), Fraser et al. (1997), and Mahathevan (1997) among others, document the

extensive usage of analytical procedures, more specifically, the simple techniques. Moreover, Coglitore and Berryman (1988) point out that simple analytical procedures could have been used to identify the fraud in many of the notorious management fraud cases in the last fifteen years. Further, Reneau (1991) shows analytically how even relatively imprecise analytical procedures can be expected to be useful in detecting errors and irregularities. Using a survey of actual audit engagements, Hylas and Ashton (1982), Biggs and Wild (1985) and Wright and Ashton (1989) find evidence that a significant portion of material financial statement errors are initially signalled by analytical procedures. Consequently, analytical review results may alert auditors to the condition of the client's financial statements. For example, Johnson (1988) found that poor financial condition was a good indicator of the presence of material errors, and Kreutzfeldt and Wallace (1986) found that firms experiencing adverse financial conditions had about 60 percent more errors than those not experiencing problems.

In regard to the use of analytical procedures by auditors in practice, recent research has been conducted. This stream of research is an extension of several earlier studies. The reason for the extension is to consider many changes in the audit environment. For example, the more extensive use of micro-computers and developed software packages in the audit. In addition, the issuing of new audit standards, and the highly competitive market for audit services as well as the litigious nature of today's audit environment. Ammen and Strawser (1994) provide more recent information on the use of six selected types of analytical procedures by practicing auditors in the US. The results of this study indicate that auditors utilize relatively simple analytical procedures in the audit examination rather than more sophisticated ones. In addition, consistent with SAS No. 56 requirements, analytical

procedures appear to be used extensively in the planning, substantive testing, and review stages of the audit examination. In addition to the requirements of SAS No. 56, respondents cited the increased use of microcomputers and increased fee pressures as primary reasons for the extensive use of analytical procedures in audit examinations. Similarly, Fraser et al. (1997) reported the results of a large-scale survey on the current use of analytical procedures within the UK. The results show that more effective audit comfort, rather than competition between firms, was regarded as the most important factor driving the increased use of analytical procedures. Straightforward analytical review techniques were regarded as cost-effective and were found to dominate the regression analysis techniques. In Singapore, Mahathevan (1997) conducted a study that examines auditors' use and perception of analytical procedures. The findings of this study indicate that analytical procedures are used more prevalently during the final review stage as opposed to the detailed testing phase of an audit. Further, auditors with high experience tend to use analytical procedures to a greater extent than those with low experience. All auditors more frequently use simple procedures than sophisticated procedures.

The second sector of research appears to develop a proper approach to performing such procedures and the effectiveness of different types of analytical procedures. A great number of the studies in this area have recognized the increasing pressures to minimize audit costs, thus promoting the development of more sophisticated and effective analytical procedures tools. In this regard, these studies have focused specifically on the effectiveness and benefits of regression analyses and other structural models (e.g., Knechel, 1988 and Chen and Leitch, 1999). These papers examined simulation results that formulated expectations, compared these to reported results, identified differences, and evaluated the

effectiveness of simple and multiple regression models in detecting errors. Alternative autoregressive integrated moving average (ARIMA) and seasonal trend analysis tools have been shown to be effective in governmental and business sectors for forecasting and analysis. These tools are sensitive to patterns over time in single series of data sets or among groups of variables. The more disaggregated the data are, the more precise the estimates and the more reliable the analytical procedures. Issues such as the influence of measurement error and various statistical problems common in regression applications have also been addressed, leading to guidance in applying quantitative tools. Empirical evidence in actual applications of statistical models and results obtained are shared, facilitating further development.

Other studies in this sector of research have emphasized preliminary analytical procedures, primarily trend- and ratio-based procedures. For instance, Loebbecke and Steinbart (1987) and Blocher and Cooper (1988) have shown these procedures to be relatively ineffective at detecting material error. However, as mentioned above, survey studies in analytical procedures (e.g., Ameen and Strawser, 1994; Fraser et al., 1997; and Mahathevan, 1997) have found practising auditors to be more inclined to adopt such simple tools for the reasons of cost effectiveness and the simplicity in applying these tools.

The third sector of research has emerged since the 1980s. This series of research has placed increasing emphasis on an auditor's ability to use analytical procedures tools effectively and on understanding the decision process of auditors when performing analytical procedures. Kinney and Uecker (1982) and Libby (1985) were two of the first studies to investigate auditor judgement in the context of analytical procedures. By identifying problems occurring in the application of auditor judgement while performing

analytical procedures, potential areas of improvements in the practice of analytical procedures were highlighted. For example, Biggs et al. (1988, p. 159) suggest that auditors are not fully utilizing analytical review, specifically, that analytical review procedures are used to extend detailed testing when the review signals potential problems but not to reduce detailed testing when the review signals account balances are in order. Their conclusion indicates that auditors are cautious in relying on analytical review data. Such a conservatism trend may reflect the audit training that emphasizes conservative judgements (Cohen and Kida, 1989, p. 264). In this respect, Joyce and Biddle (1981a) and Kida (1984) in their tests of heuristics used in auditing contexts, reveal that auditors' decisions do not always coincide with heuristics developed in the psychological literature. Libby (1985) describes the judgement process used in analytical review as a diagnostic process.

Biggs et al. (1988) argue that the two factors of technological progress and the emergence of judgement research set the stage for increased interest in research on analytical procedures in the early 1980s and demonstrate the linkage of technical research on analytical procedures with judgement-related research on these procedures.

2.4 Individual Psychological Differences

All of us in dealing with the vicissitudes of life have specific styles, "ways of thinking and perceiving, ways of experiencing emotion, modes of subjective experience in general, and modes of activity that are associated with various pathologies" (Shapiro, 1965, p. 1). We all possess certain patterns (individual psychological differences) of dealing with the environment which are deeply embedded, pervasive and likely to

continue. These patterns involve two related dimensions: personality and cognitive complexity. Personality refers to the attitudes or beliefs of individuals, while cognitive complexity reveals a person's capacity to cope with information, or more precisely, with quantities of positive and negative stimuli (Rowe and Mason, 1987).

Early accounting research on cognitive characteristics examined the usefulness of accounting information by defining relevant information and by determining the appropriate methodology for defining decision models and the optimal reporting environment (e.g., Benbasat and Dexter, 1979; McGhee et al., 1978 and Gul, 1984). There are empirical inconsistencies in findings of the relationships between cognitive characteristics and decision performance. Ashton (1982) attributes these inconsistencies partly to the lack of a well-defined theoretical construct for assessing the quality of accounting decisions.

Ho and Rodgers (1993) indicate that there is a trend in behavioral accounting research to include cognitive characteristics when researching decision makers' knowledge acquisition and judgement performance. Bonner and Lewis (1990), for example, report that cognitive characteristics (e.g., natural ability and knowledge) better explain variations in performance between experienced and inexperienced auditors than do years of experience.

Another stream of accounting research in the area of individual psychological differences focuses on an understanding of these individual differences among the users of accounting information. Hunton and McEwen (1997) investigate associations between experience, cognitive information processing factors, motivational incentives and earnings forecast accuracy. They found that analysts' forecasts of earnings tend to be

optimistic. Analysts' optimism may be attributed to experience, cognitive information search strategies, motivational incentives or some combination thereof.

The definition of personality and cognitive complexity by (Rowe and Mason, 1987) which was cited above allows us to make a distinction between cognitive complexity and personality traits. Some leading writers in psychology (e.g., Mischel, 1973, p. 253) also recognize this distinction between "cognitive variables" and "personality dimensions." Since individual differences have two facets, it is conceivable that individuals of the same personality type may use different methods of coping with available information (cognitive complexity). Alternatively, individuals with the same cognitive complexity may have different attitudes and beliefs (personalities). Thus, it is argued that an examination of any one of these dimensions separately without adequate consideration for variations in the other dimension may distort research findings. This viewpoint is also shared by psychologists (e.g., Loomis and Moskowitz, 1958; Mischel, 1979 and Gul, 1984), who stress that personality traits are only one dimension of response and, therefore, have limited explanatory power.

Bearing these ideas in mind, research on the effects of individual differences in decision making could more productively examine the effects of personality variables, taking into account the fact that different cognitive processes are at work in decision making. Further, following the suggestion by McGhee et al. (1978, p. 681), these variables could interact and act as "mediating variables between the receipt of information and resultant decisions." Such a research design is conceptually more appealing and consistent with current behavioral theory (Pratt, 1980, p. 504), which emphasizes the interactive and moderating aspects of behavior predictions.

2.4.1 Optimism (personality dimension)

The concept of optimism and pessimism have stimulated a great deal of research interest in recent years. Studies have found that optimism is related to more adaptive coping behavior in stressful situations (e.g., Scheier and Carver, 1987), as well as greater physical and psychological well-being (Scheier and Carver, 1985 and 1987). Pessimism, on the other hand, has been linked to depression, anxiety and avoidant coping patterns (Scheier and Carver, 1987).

Although there is little doubt that optimism and pessimism are important for well-being, the specific nature of these concepts has not yet been clearly delineated (Chang et al., 1994). There are still no generally accepted definitions of optimism and pessimism. Most investigators have adopted Scheier and Carver's (1985) view of optimism and pessimism as generalized positive and negative outcome expectancies. However, some investigators (Dember et al., 1989) have defined these concepts more broadly as a positive and negative outlook on life. Whereas Scheier and Carver's concepts are future-oriented, the latter view encompasses present perceptions and appraisals as well as future expectations.

The limited research on the individual differences in optimism has hinted that these differences may have important consequences for behavior. Scheier and Carver (1985) have begun the exploration of the possibility that optimism, construed as a stable personality characteristic, has important implications for the manner in which people regulate their actions. They presume that when persons are confronted with impediments to goal-attainment during the course of their daily lives, they temporarily suspend their

behavior and attempted to decide whether or not future efforts will be futile. Subjects of the study were 79 undergraduate men and 62 undergraduate women enrolled in introductory psychology courses at Carnegie-Mellon University. Each subject completed an identical set of questionnaires at two different points of time. The first set of questionnaires was administered exactly 4 weeks prior to the end of the semester. The second set of questionnaires was administered on the subjects' final day of classes, immediately prior to the start of the final examination period. Both sets of questionnaires were completed while the subjects were in groups. The findings of the study offered substantial support for the presumed assumption.

In a recent article, Hartz and Elrod (1996) drew attention to the important matter of optimism in human risk assessment. They argued that, potentially, emotion was as important as cognition in leading to biased assessments, and that the interaction of the two had been neglected in prior research. They suggested that quantitative research was needed to find out how far emotion explained human choice in the face of risk, and to enhance the prediction of risk. The article was important both because it pointed to a topic which has been under-emphasized in past research, and because it has considerable practical significance.

In a business context, "positive thinking" would involve an individual's predisposition to anticipate the best possible outcome in the face of uncertainty. Support for this possibility can be derived from considering behavioral self-regulation theory, a portion of which describes the series of events presumed to occur when barriers to goal attainment are encountered (Carver and Scheier, 1985). This theory suggests expectations of favorable outcomes cause people to renew their efforts to realize a priori goals. By

contrast, unfavorable expectancies may result in a reduced effort or even a complete disengagement from a particular activity (Lee et al., 1993).

Generalized expectancy can be portrayed as a composite of individual expectancies made at varying levels of specificity. Several studies have observed a relationship between optimistic expectations and the manner in which people cope with a variety of non-work related stressful events (e.g., Scheier, Weintraub and Carver 1986). This inquiry suggests the level of dispositional optimism that characterizes people is likely to mediate how they will choose to respond to stress.

Seale et al. (1995) have investigated the issue of decision making under strict uncertainty. They found that it is possible to predict people's behavior in some situations based on their choices in other (similar) decisions, but this tendency is not related to what the personality inventories that the researchers chose describe as optimism or pessimism.

Though psychologically healthy and effective people maintain accurate perceptions and good contact with reality, there is evidence that maintaining overly positive beliefs about our own self-worth and our degree of personal control are associated with effective use of problem-focused coping and ability to adapt successfully to stressful events (Scheier, et al., 1989; Scheier et al., 1986). There is also evidence that optimistic people deal better with negative information that challenges their positive beliefs and make better use of the information to solve problems. They are better at reading environmental cues and selecting situations and tasks that they can control, and they also know when to quit situations that they cannot change (Janoff-Bulman, 1989).

Scheier et al. (1986) investigating the strategies that optimists and pessimists use to cope with stress, found that optimism was positively associated with the use of

problem-focused coping, especially when situations were seen as controllable. Under the category of emotion-focused coping, optimism was positively correlated with the use of positive reinterpretation and with acceptance or resignation, but only when subjects saw the situation as uncontrollable. In addition, optimism was inversely associated with denial or distancing. Pessimists, on the other hand, tend to focus on their feelings which are linked to depression, anxiety and avoidant coping patterns.

2.4.2 Patterns-for-Coping

The term coping refers to the responses made by an individual to a situation with a potential harmful outcome. Cohen and Lazarus (1979) have offered a more formal definition of coping. They defined coping as an “effort, both action oriented and intrapsychic (mental and emotional reactions), to manage environmental and internal demands and conflicts which tax or exceed a person’s resources.” Therefore, the general style of coping is to assume that when people are presented with an unstructured stimulus and are asked to complete it or make sense out of it, they will do so in a way that reveals their underlying cognitive complexity. People who reveal a relatively low capacity to deal with the details emanating from a company’s reports or financial information take any steps to buffer themselves from the information or channel it to someone else. On the other hand, individuals who have a vigilant information-processing attribute are likely to have a relatively high capacity to deal with the accessible information.

According to their capacity of coping, people could be classified by their coping strategies as copers or avoiders on the basis of their responses to the stimulus. Coping strategies are thoughts and actions that we use to deal with stressful situations and lower

our stress levels (Auerbach and Gramling, 1998). Consequently, Lazarus and Folkman (1984) have distinguished between two broad types of coping techniques: problem-focused and emotion-focused. When using problem-focused coping, we attempt to do something to change or get away from the things that are causing us emotional upset. When using emotion-focused coping, we try to minimize the stress reaction directly without confronting or trying to do something about the cause of the stress. Kahn et al. (1964) point out that problem-focused coping implies strategies for altering environmental pressures, resources, procedures, and the like. In addition, it includes strategies that are directed at motivational or cognitive changes such as shifting the level of aspiration, finding alternative channels of gratification, and learning new skills and procedures.

The definition of coping functions depends on the theoretical framework in which coping is conceptualized, and/or on the context in which coping is examined. For example, when coping is formulated within systems of ego processes, its central function is the reduction of tension and the restoration of equilibrium (Lazarus and Folkman, 1984). In contrast, the maintenance of equilibrium is not a background concern for Janis and Mann (1977), who formulate coping functions within a decision-making framework. In their model, the primary functions of coping have to do with decision making, particularly the search for and the evaluation of information. According to their model, Janis and Mann have discerned five basic patterns of coping behavior that affect the quality of decision making. One of the patterns is vigilance, which results in thorough information search, unbiased assimilation of new information, and other characteristics of high-quality decision making as described in the account of vigilant information

processing. Mackworth (1957) has defined vigilance as a state of readiness to detect and respond to certain specified small changes occurring at random time intervals in the environment. The other four patterns are occasionally adaptive in saving time and effort, especially for routine or minor decisions that do not have serious consequences. But they often result in defective decision making when the decision maker is confronted with a vital choice that has serious consequences for himself or for the organization on whose behalf he is making the decision. These four patterns are: (1) unconflicted inertia; (2) unconflicted change to a new course of action; (3) defensive avoidance; and (4) hypervigilance. Therefore, copers are people who, when faced with threats, tend to be very vigilant for ways to actively deal with the stress; they would be expected to initiate more problem-focused than emotion-focused coping strategies. In contrast, in situations that are arousing avoiders would be more prone to suppress their emotions by using avoidance or denial and would be less prone to actively seek out ways of defusing or moderating the source of stress itself.

In the context of this study, an individual auditor's coping strategy is hypothesized to affect his/her judgment of the fairness of accounting estimates depending on whether he/she is a highly vigilant or a less vigilant. Highly vigilant auditors are likely to cope with the ill-structured task, which is characterized by the lack of sufficient appropriate evidence (examining accounting estimates), by searching painstakingly for relevant information and assimilate such information in unbiased manner to infer corroborating evidence. They are likely to benefit from the signals, which become visible through the analysis of analytical review results. In contrast, less vigilant auditors may compromise by not giving the required level of attention to all available information for

different reasons (e.g., time constraints). They are prone to cope with the situation by uncritically adopting whichever new course of action is most salient or most strongly recommended, impulsively seizing upon hastily contrived solutions that seem to promise immediate relief, or constructing wishful rationalizations to bolster the least objectionable alternative. It is argued that audit training is not necessary to alter the cognitive nature of the auditor in terms of coping by adopting problem or emotion-focused strategies. Davies and Parasuraman (1981) reported that it is not fully understood whether the effects of training on perceptual efficiency "vigilance" are obtained. Therefore, the effort of auditing accounting estimates (audit hours) under these two classifications is hypothesized to be significantly different.

2.5 Effects of Experience

The ability to recognize and select relevant information or cue selection in a complex judgement process is a hallmark of superior performance achieved by experienced decision makers. Audit firms expect auditors to have the requisite conceptual knowledge, ability, motivation, etc., to handle particular audit judgements at certain levels of general audit experience. A firm's training programs, hiring practices, and audit assignment structures are set up to mitigate some of the individual ability differences so the firm can rely on judgements of its auditors at a given level of experience. Audit staffing structure in most firms dictates that senior level auditors make the preliminary judgements in some tasks. New seniors, although they have conceptual training, have little if any task specific experience and may lack the experience needed to make effective and efficient audit judgements.

Behavioural researchers have long been concerned with studying the experience of decision-makers and its effects. According to Libby's (1993) model, auditors acquire knowledge primarily through instruction and experience. Instruction varying in length, content, and style may be received both formally and informally in college and through continuing education courses. Individuals also might learn from practice in performing tasks and receiving feedback on their judgements. Both practice and feedback are considered part of experience. Bonner and Walker (1994) focused on the acquisition of knowledge through various combinations of instruction and experience. Their results indicate that combinations of instruction and practice without feedback do not produce knowledge. Practice with explanatory feedback and any form of instruction creates gains in knowledge, but may not always be available in the audit environment.

Hamilton and Wright (1982) hypothesize that the possible reason for the mixed results reported by studies of the impact of experience on audit judgement, may be due to task complexity. That is, experience may be critical for complex judgements, but unimportant for routine, structured decisions. Abdolmohammadi and Wright (1987) compared the judgements of subjects with varying levels of audit experience across three decision settings: structured, semi-structured, and unstructured tasks. Their findings suggest that task complexity is an important factor that should be explicitly considered in investigating experience effects. In his examination of the characteristics of experienced and inexperienced auditors' retrieval of internal controls from memory, Frederick (1991) found that an auditor's retrieval of internal controls from memory depends not only on the auditor's level of experience but also on the way in which the auditor's knowledge of controls is organized. Experienced auditors freely recalled more internal control

procedures from the schematic than the taxonomic organization. Frederick (1991) defined these two kinds of knowledge organization as: (1) a taxonomic organization which is a hierarchical structure in which the locations of categories are interconnected based on class membership and similarity relationships among class members, and (2) a schematic organization which is a spatially and/or temporally organized structure in which the parts are connected on the basis of contiguities that have been experienced in space or time. Libby (1985) encountered the presence of schema by experienced auditors in identifying likely errors present from analytical review fluctuations.

Since the literature manifests the significance of experience in the professional audit judgements, especially in situations where tasks are unstructured, it is argued that experience acts a major role in constructing models of the problem space that are then mentally run or manipulated to produce expectations about the environment. An auditor who has experience will be able to possess schemata, which provide information about relevant concepts that may be pertinent in making efficient judgement.

CHAPTER III

THEORETICAL FRAMEWORK

3.0 Overview

Professional judgement is the goal-directed process of deciding or choosing some actions with due care, objectivity, and integrity within the framework of the appropriate professional standards (Gibbins and Mason, 1988). This chapter illustrates the cognitive processes by which the auditors of financial statements use their knowledge to form professional judgements. It also explains how audit judgements are made. By using the cognitive theory of induction as outlined by Holland, Holyoak, Nisbett, and Thagard (1986), the chapter describes how the auditor develops and uses audit judgement. The key conceptual variable in the cognitive theory of induction is the mental model, which is a dynamic representation of the judgement situation or problem. The raw materials of mental models are rules that relate conditions to actions and that represent various concepts and procedures. It is argued by Anderson et al. (1991) that the mechanisms for refining existing rules, generating new rules, and making inferences within the mental model form the basic reasoning skills used in professional audit judgement. Therefore, a combined concept of the mental model was developed to include the relationship between personality, cognitive complexity, accounting information, and audit judgement.

3.1 Inferential Rules

Audit judgements involve obtaining and evaluating evidence regarding assertions about economic events. As such, audit judgements are goal-driven evidence-based tasks (Anderson et al., 1991, p. 50). A useful perspective for discussing the processes involved in such judgements is the cognitive theory of induction outlined by Holland et al. (1986). This inductive-inference theory is based on the premise that people reason by manipulating selected goals and knowledge within the framework of a mental model. A mental model is a dynamic representation of the problem that changes as new information is considered and consequences of potential judgements are appraised.

The cognitive theory of induction suggests that the auditor determine the goal, or desired state, for the problem situation. A goal might be as simple as attaching a name to an observed set of client controls or as complex as rendering an audit opinion on the fairness of a set of financial statements. The cognitive theory of induction further suggests that the auditor's knowledge is brought to bear on a goal-directed problem situation through the mechanism of the mental model.

The mental model integrates knowledge in various ways depending on the selected goal. In the case of auditing accounting estimates and the available knowledge from analytical review results, the auditor would likely have separate knowledge structure representations containing information about their attributes. In determining whether or not accounting estimates assertions need additional effort "audit hours" because of the results of analytical review, these concepts could be brought together for problem solving (judging the reasonableness of accounting estimates balances). Since the combined concept of "accounting estimates audit and analytical review signals" is not likely to be one for which

the auditor would have a ready-made knowledge structure, a mental model would be generated to describe this joint concept. It is through the process of manipulating this mental model that the best possible judgement eventually would be identified.

3.2 Mental Models and Rule Systems

A model typically preserves only some aspects of the world. What defines the appropriate degree of preservation? The answer is fundamentally pragmatic, and it highlights the link between mental models and problem solving¹. From the point of view of the cognitive system, relatively few environmental states have direct value to the system. The values of other states in relation to satisfaction of the system's goals must be inferred. The fundamental use of induction is to generate models of the environment that the cognitive system can use in selecting actions that will lead to environmental states with positive value. For example, the auditor evaluates the reasonableness of accounting estimates made by management in the context of financial statements taken as a whole. In this matter the auditor is likely to use the signals from financial and nonfinancial relationships to generate models that provide means for judging accounting estimates. The cognitive system attempts to plan a sequence of actions that will transform the initial

1. Although this approach of problem solving overlaps in many ways with the widely accepted view of the conventional approach (means-ends analysis), several salient differences may arise. Because the main interest of the induction theory outlined by Holland et al. (1986) is in the fuzzy, ill-defined sorts of problems that abound in real life, it augments the conventional approach to problem solving with mechanisms for seeking additional knowledge stored in memory that may clarify ill-defined problems. Rather than simply applying operators to a fixed problem representation, the representation itself may be transformed by recategorizing problem components and by retrieving associations and analogies. Such restructuring implies that search takes place not only in the space of potential "next states" along a temporal dimension but also through a space of alternative categorizations of the entities involved in the problem. This type of processing depends on the parallel activity of multiple pieces of knowledge that both compete with and complement each other in revising the problem representation.

problematic state into a goal-satisfying state. An adequate mental model can accomplish this task by mimicking the environment up to an acceptable level of approximation. The model needs only describe aspects of the environment and of the system's actions that are relevant to the attainment of goal-satisfying states. An "ideal" problem model is one that describes all those elements of the world necessary and sufficient for the concrete realization of a successful solution plan. The process of induction is directed by the goal of generating mental models that increasingly approximate this ideal.

In the rule-oriented framework, the presentation of the environment is formed and altered by the application of *condition-action rules*, which have the general form, IF (condition 1, condition 2, ... condition *n*), THEN (action). Satisfaction of the conditions depends on *matches* between the conditions and active information in memory. "Active" information, in contrast to "stored" information, is declarative knowledge currently being processed by the cognitive system. The theory does not assume that the information is necessarily linguistic or propositional in nature. Active information may come directly from perceptual input, from other rules, or from a memory store containing declarative knowledge. For convenience and uniformity, the theory considers all such information as being in the form of *message* (which collectively comprise a message list) sent from various parts of the system (the input interface, the rule processor, declarative memory, and so on) to the rule processor. The actions of matched rules determine what the system will do; that is, the rules incorporate procedural information. The actions of rules can include not only outward-directed actions (actions of the cognitive system on its environment) but also inward-directed actions (modifications of the system's store of knowledge).

According to the Holland et al. (1986) theory, manipulating mental models toward the goal requires procedural rules that provide the basis for altering existing knowledge contained in default and exception rules. There are three major types of procedural knowledge that the theory focuses on:

- (i) *Empirical rules*: these rules determine how relationships between conditions and actions should be modeled. Empirical rules can model time-dependent relationships (i.e., how information currently represented in the mental model may change over time). “If the client implements controls related to segregation of duties in the accounting department, then there will be a decreased likelihood in the future of financial statement errors and irregularities” is an example of a time-dependent empirical rule. Alternatively, empirical rules can model time-independent relationships. These relationships can be further subdivided into categorical and associative relationships. Categorical rules provide information about hierarchical category relations, such as determining category membership and assigning properties to them. For example, “inventory evaluation” and “the adequacy of the allowance for doubtful accounts” are included in the category of “profitability.” Associative rules, in contrast, relate concepts that have nonhierarchical relations and merely allow one concept to remind the cognitive system of another concept by activating it in memory. For example, “adverse difference between the actual collection period and the period in the standard credit terms” and “any declining trend in the actual collection period” is associated with “the adequacy of the allowance for doubtful accounts.”

(ii) *Inferential rules*: whereas the function of empirical rules is to model the world, the primary function of inferential rules is to produce better empirical rules. Hence inferential rules are necessarily more abstract than empirical rules, obtaining over a broad range of content domains. Their domain of application need not be unrestricted; some inferential rules will concern relations, for instance, whereas others underlie reasoning about regulations. Inferential rules specify procedures that guide thinking and thus are used to make inferences, to direct the course of problem solving, and to control inductive mechanisms. For example, the use of analogy in problem solving might be controlled by the following inferential rule: "If you are at impasse and a concept corresponding to a different problem is activated in memory, then try to draw an analogy between the activated problem and the one with which you are having trouble" (Holyoak & Nisbett, 1988).

(iii) *Operating principles*: Unlike empirical and inferential rules, operating principles are neither learnable nor teachable. These represent innate procedures through which the cognitive system governing the mental model is manipulated. System operating principles include mechanisms for retrieving relevant rules, a bidding system for competing rules, and procedures for action initiation.

Rules are the main building blocks for the induction theory, but for efficient operation a processing system must have its rules organized in relation to each other. This organization arises from patterns of conditions and actions relationships. Some of these patterns can come through pointers that are used to link rules directly together. The patterns

of organizations provide data structures that constitute *clusters* of rules that are to be considered together.

One consequence of viewing categories as rule clusters is that it implies the possibility that, within limits, complex sets of interrelated features will be learned more readily than isolated feature co-occurrences. The rules that constitute a category do not provide a definition of the category. Instead they provide a set of expectations that are taken to be true only so long as they are not contradicted by more specific information. In the absence of additional information these “default” expectations provide the best available sketch of the concurrent situation (Holland et al., 1986).

Rules and rule clusters can be organized into *default hierarchies*, that is, hierarchies ordered by default expectations based on subordinate/superordinate relations among concepts. For example, knowing that something represents specific risk relevant to the audit produces certain default expectations about it. These expectations, however, can be overridden by more specific expectations produced by evidence that the specific risk is from the fluctuation of the profitability of the company. These specific expectations, in turn, may be overridden by still more specific expectations, such as evidence that the profitability fluctuation is from the inadequate allowance for doubtful accounts. A set of rules or pointers can be used to establish time-independent relations between categories. By virtue of these connections an object linked to one category is implicitly linked to a network of categories.

Inherent in the notion of a default hierarchy is a representation of the uncertainty that exists for any system that operates in a world having a realistic degree of complexity. Default hierarchies are a way of representing, at one level, the useful generalizations that may be drawn upon for modelling the world, and, at a lower level, those that may be drawn

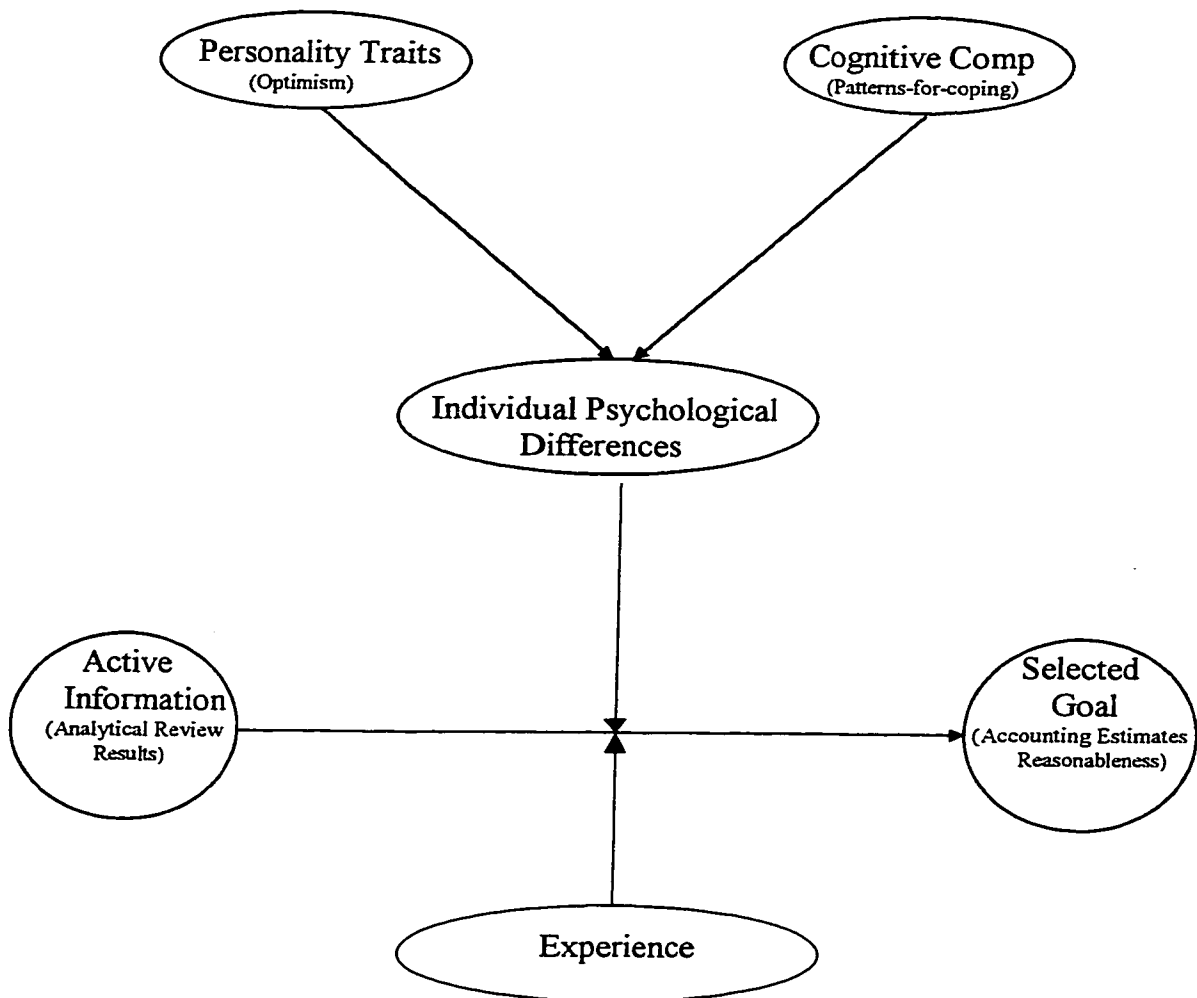
upon for representing crucial exceptions to those generalizations. Default hierarchies are capable of representing both the uniformities and the variability that exist in the environment. This representation serves to guide the kinds of inductive change that systems are allowed to make in the face of unexpected events.

3.3 The Combined Concept of the Model

In this study's model, the intent of integrating the knowledge-in its various ways- is to form an opinion concerning the reasonableness of accounting estimates balances in the context of financial statements. Therefore, the process of manipulating the mental model consists of the combined concept of accounting estimates reasonableness as a selected goal, and active information (analytical review results) moderated by individual psychological differences. The model also reflects on experience levels as a knowledge acquisition factor. Figure 1 exhibits the combined concept of this model.

Figure 1

The Relationship Between Personality, Cognitive Complexity, Accounting Information, and Audit Judgement



3.3.1 Analytical Procedures for Auditing Accounting Estimates

The interplay of SAS No. 57 "*Auditing Accounting Estimates*" with other pronouncements in both the audit and accounting literature led to practice effects (Wallace, 1993, p. 126). This interplay could be with the standard of *Analytical Review Procedures*. It is designed to improve the auditor's effectiveness in detecting misstatements (Callahan et al., 1988, p. 56). In this respect according to Section 5305 (CICA, 1996), the auditor is required to obtain sufficient appropriate evidence when assessing the significant estimates management made in the financial statements. This Section provides guidance to auditors on obtaining and evaluating sufficient competent evidential matter to support significant accounting estimates in an audit of financial statements. However, the auditor is challenged with an ill-structured task that requires practising a judgmental process in the function of gathering convinced evidence. Thus, as discussed by Keenan (1979) the issue of indirect or circumstantial evidence can come to play an important role in such situations when there is no direct support for one fact and its existence must thus be inferred from another fact. The literature encourages the use of rational argumentation or inference in many cases when it provides the only evidence available to the auditor. Gary (1991) points out that although we have only a weaker grade of evidence, it must be considered as primary evidence as no better evidence exists.

Changing what auditors do will mean exploring ways of improving the quality of audit evidence obtained on accounting estimates. To some extent, it is useful to challenge the traditional notions about what constitutes sufficient appropriate audit evidence and how to go about obtaining it. In many cases, the primary source of evidence for accounting

estimates is enquiry of management. Traditionally, this type of evidence has not been considered very reliable because it is often unsubstantiated and originates from the entity. The auditor is often unable to corroborate such enquiries by gathering additional evidence that, according to Section 5300 (CICA, Handbook), would be considered more reliable by virtue of its nature and source. Section 5300 hints at such an approach when it discusses the need to corroborate enquiries made. Paragraph 5300.26 states that "a response from a person within the entity does not usually constitute sufficient appropriate audit evidence in itself but requires corroboration." Smith (1994, p. 58) argued that some professionals in other fields often rely on enquiry as their primary source of evidence. Their enquiries, however, tend to be more rigorous and purposeful. Responses are corroborated by further enquiries, and inconsistencies in responses and in actions related to the subject of the enquiries are followed up. Hence, it is meaningful to consider some other corroboration, which may include the assessment of the inherent risk for the entity as a whole. This may indicate inconsistencies in actions by the management in preparing the accounting estimates with the financial situation of the company. Callahan et al. (1988, p.66) indicate that, based on the understanding of the internal control structure and the assessment of audit risk, the auditor may identify certain accounting estimates as significant risk areas and extend audit procedures in those areas. For instance, if the system of control is adequate, the auditor may infer that the information produced by it is also adequate. In addition, if the analytical review results indicate that the company experiences distress or errors, the auditor must expand his effort in investigating accounting estimates, which are susceptible to misstatements in such situations. Asare and Davidson (1995) provide insights into how variations in control procedures (control risk) and financial condition (inherent risk) affect

auditors' anticipations of errors in various account balances. The subjects were auditors (partners, managers, and staff) from four international accounting firms in a large Canadian city. They found auditors' expected error judgements to be sensitive to the client's control system. The patterns of responsiveness to the financial condition manipulation were more complex.

Therefore, auditors are expected to utilize any and all analytical review information in their decision making. A typical set of financial statements provides the opportunity to compute literally thousands of ratios. A key question for the average auditor therefore is what ratios should I compute? There is, of course, no universally accepted answer to this question. Experience indicates, however, that minimum audit coverage should include computation of an appropriate ratio in at least seven different categories. This will provide the auditor with data about most of the significant underlying economic relationships for the normal firm. Individual industry differences will usually call for some industry specific ratios in addition to the minimum list in table 1.

Each of the seven categories represents a factor that is an underlying economic dimension of an individual firm. Within each category there are many possible ratios to compute. Research suggests that the ratios within each category are normally highly correlated (tend to move together). This means that it is normally only necessary to compute one appropriate ratio in each category. The auditor's task, therefore, becomes one of selecting an appropriate ratio in each of the categories.

Table 1

The minimum categories of common ratio classification

Category	Example Ratio
Short-term liquidity	Current ratio
Cash position	Cash/total assets
Inventory turnover	Sales/inventory
Receivable turnover	Quick assets/sales
Return on investment (Profitability)	Net income/total assets
Financial leverage	Total liabilities/Net worth
Capital turnover	Cash flow/total assets

3.3.2 The Moderating Effects of Individual Differences

It is recognized that personality variables and other characteristics of the decision maker, such as anxiety traits, habitual coping style, and information-processing capability, have a major influence on predisposition to use one or other of the patterns and frequency of usage (Janis and Mann, 1977, p. 71). It is also expected that individual differences in predisposition to optimism/pessimism (Scheier and Carver, 1985) will lead decision makers to depend more often on particular overlearned coping patterns when facing difficult decisions.

When considered in the context of a stressful audit situation, an auditor's expectancy regarding a situational outcome can range from the very specific (e.g., can I successfully resolve this specific problem regarding the reasonableness of accounting estimates) to the moderately general (e.g., can I achieve the task with minimum risk) to the very general (e.g., am I usually successful at what I attempt). Most expectancy based theories assume the best prediction of an outcome will result when the expectancy in question matches the level of specificity that the outcome suggests (Scheier and Carver, 1985 and 1987). If so, then generalized expectancies such as dispositional optimism should be influential on outcomes that are either general in scope or influenced by multiple sources (Scheier, Weintraub and Carver 1986). Generalized expectancies may also perform a major role in influencing those outcomes where an auditor has no prior experience or that resolve themselves slowly over time (Scheier and Carver 1987).

The accounting literature indicates that in the setting of audit tasks, auditors are not generally consistent with the findings of psychological literature. For example, Joyce and Biddle(1981a), and Kida(1984) in their tests of heuristics used in auditing contexts, reveal that auditors' decisions do not always coincide with heuristics developed in the psychological literature. Such trend may reflect the audit training that emphasizes conservative judgements (Cohen and Kida, 1989, p. 264). In this respect, it is argued that some other individual aspects may play a major role in directing the auditor's judgement. Personality traits are asserted to shape the decision-maker's behaviour, and cognitive aspects maintain the framing of his/her thinking. Thus, for the rational person other than auditor, it is expected to behave according to the given scenario by decreasing or increasing the planned hours according to the situations. In other words, he/she is expected to identify

problems (areas of potential concerns) to increase the planned hours, or opportunities (areas of little concerns) to decrease the planned hours. However, auditors are expected to behave in some different manner by increasing the planned hours or maintain the plan unchanged without any consideration for decreasing these hours.

For the purpose of this study, it is likely that optimistic auditors (personality trait)-in the best scenario (analytical review results signal no fluctuations)- will not decrease their efforts for auditing accounting estimates. However, they will take advantage of the analytical review results signals (fluctuations) as a motivation to exert more effort on the task under audit. They adopt this strategy to satisfy themselves that the situation is controllable and the settlement of the issue is feasible.

In contrast, pessimistic auditors are anticipated to be radically conservative. They are expected to increase audit efforts more than optimistic auditors do. This is expected to hold whether analytical review results signal fluctuations or not.

With respect to the cognitive aspects, auditors can cope with the stressful situation by adopting an appropriate strategy. In this regard, coping refers to an individual's efforts to manage the psychological demands of any environment that is straining the person's resources (Folkman et al. 1985). Coping efforts have two primary functions: managing the problem causing the distress (either reducing, mastering or tolerating the situation) and governing emotions. People face a variety of coping options; some of them generally beneficial to their organization, others that are not. These options include, among others, changing the stress-inducing situation, accepting it, seeking more information, holding back from impulsive acts or withdrawal from the situation.

Two general strategies exist through which people can cope with stressful situations (Folkman et al. 1986). One, problem-focused coping, involves activities that are driven by the goal of removing or going around the source of the stress. The second strategy, emotion-focused coping, involves attempts to reduce or eliminate the emotional distress associated with, or caused by, the stressful circumstances. Problem-focused and emotion-focused coping can occur together in the same stressful situation. However, for most people one or the other coping strategy generally predominates (Folkman and Lazarus 1980).

Within an audit environment, an example of a problem-focused coping tactic would include skillful attempts initiated by the auditor with the goal of modifying the situation. But problem-focused coping could also include cool, rational and deliberate efforts to overcome the problem causing the stress. Emotion-focused coping includes tactics aimed at distancing oneself or outright “escape” from the stressful situation. But emotion-focused coping could also include the pursuit of social support or self-control, the acceptance of responsibility, or positive reappraisal of the situation.

Over time, regardless of the strategy that predominates, coping usually ameliorates stress (Carver, Scheier and Weintraub 1989). However, the coping strategy used can prove to be more or less desirable from the firm's perspective and for the professional prospects of the auditor. For example, if auditors tend to believe they can not remove or even reduce the source of the stress, they may dissociate themselves from the audit goals impeded by the stressor. Such giving-up or disengagement responses would generally subvert the firm's and individual's well-being. By contrast, coping activities

directly aimed at appropriately treating the source of the stress are likely to also facilitate the firm and individual's interests.

For the purpose of this study, auditors are assumed to cope with the task of auditing accounting estimates by adopting different vigilance strategies. Highly-vigilant auditors are foreseen to adopt a problem-focused strategy by searching intensively for relevant information (analytical review results) and assimilate such information in an unbiased manner to infer corroborating evidence. On the other side, less-vigilant auditors will be comfortable with the emotional-focused strategy. By adopting this strategy they tend to construct wishful rationalizations to bolster the least objectionable decisions or judgements.

3.3.3 Experience Effect

A number of recent auditing studies have examined the nature of the knowledge base and memory retrieval processes of experienced practitioners versus novices and report distinct differences. For example, Frederick (1991) examined the characteristics of experienced and inexperienced auditors' retrieval of internal controls from memory. He assumed that knowledge retrieval is a function of the manner in which information is stored in memory. Two kinds of knowledge organization are: (1) a taxonomic organization which is a hierarchical structure in which the locations of categories are interconnected based on class membership and similarity relationships among class members, and (2) a schematic organization which is a spatially and/or temporally organized structure in which the parts are connected on the basis of contiguities that have been experienced in space or time. The findings of Frederick's study indicate that

experienced auditors freely recalled more internal control procedures from the schematic than the taxonomic organization.

The premise underlying the schema notion is that information about the likely properties of the environment is stored in memory in clusters that can be accessed as large units and that can serve to generate plausible inferences and problem solutions. The utility and attractiveness of the schema notion may have prompted human expertise, which is critically dependent on specialized methods and representations of knowledge about the relevant domain. Holland et al. (1986) point out that for the expert, solving routine problems can be viewed as a process of retrieving an appropriate “problem schema” and providing it with problem-specific parameters. The problem schema will provide information about relevant problem concepts and specialized solution methods that may be applicable.

Accordingly, experience is assumed to affect the audit judgement in the context of auditing accounting estimates as an ill-structured task. Generally, prior researchers measure experience as the number of years the auditor has performed the task of auditing. While, decision-making experience within a given context is often positively related to decision quality, Yates (1990) cautions researchers that the development and elaboration of individual cognitive decision-making strategies is not fully dependent on experience. Yates (1990) suggests that researchers treat experience and cognitive decision strategies as independent constructs in decision models.

CHAPTER IV

RESEARCH HYPOTHESES

4.0 Overview

The cognitive theory of induction suggests that the auditor's knowledge is brought to bear on a goal-directed problem situation through the mechanism of a mental model. A mental model is a dynamic representation of the problem that changes as new information is considered and consequences of potential judgements are appraised. Accordingly, the mental model integrates knowledge in various ways depending on the selected goal. In the case of auditing accounting estimates and the available knowledge from analytical review results, the auditor would likely have separate knowledge structure representations containing information about their attributes. In determining whether or not the accounting estimate assertions need additional effort "audit hours" because of the results of analytical review, these concepts could be brought together for problem solving (judging the reasonableness of accounting estimates balances). Since the combined concept of "accounting estimates audit and analytical review signals" is not likely to be one for which the auditor would have a ready-made knowledge structure, a mental model would be generated to describe this joint concept. It is through the process of manipulating this mental model that the best possible judgement would eventually be identified.

However, the literature documents a considerable variation in the issue of consensus between studies. For example, Trotman and Wood (1991) do not find any evidence that these differences among auditors can be explained by moderator variables, including auditor experience, type of internal control system, and length of internal control questionnaire. More generally, Solomon and Shields (1994) review twenty-eight studies that model auditor judgements. They conclude that, with only a few exceptions, the results of the auditing studies are consistent with non-auditing studies. The primary result is that, at best, auditors only exhibit moderate levels of consensus. These results are consistent with Mautz's (1975) earlier concern over the lack of consistency that may exist in audit practice. The results suggest that there is scope for improvement in audit judgement and, thereby, audit practice.

An attempt to synthesize an account of the psychological processes by which auditors bring experience to bear in reaching judgements was made by Gibbins (1984). This study expands the attempt to include individual psychological differences in the process of manipulating the mental model. Based on the above discussion, several hypotheses were developed in order to construct a framework for an empirical investigation of the effect of the analytical review results and individual psychological differences (optimism and patterns-for-coping) on the effort of auditing accounting estimates assertions. These hypotheses were constructed for the model of judging the status of accounting estimates assertions in light of the inference perspective. This model demonstrates that the auditor may consider the analytical review results (fluctuations) in deciding his/her effort in auditing accounting estimates assertions, which could be moderated by his/her level of experience and the individual differences.

4.1 Research Questions

The research questions for this thesis deal with the usefulness of analytical review results in auditing accounting estimates. Auditors have to rely to a greater extent on their professional judgement for ascertaining accounting estimates, which require a considerable amount of effort. In this regard, one would assume that the auditor's mental model integrates available knowledge from analytical review results that may present him/her with a perception structure that helps determine whether or not the accounting estimates assertions need additional effort "audit hours." Further, following the suggestion by (McGhee et al., 1978, p. 681), the individual psychological differences that involve two related dimensions: personality and cognitive complexity, could interact and act as moderating variables between the receipt of information and resultant judgement. Since auditors are not all alike, there is no reason to expect them to use and evaluate the same set of information. Systematic differences among individuals can be exploited to explain variations in perceptions of risk.

The major research questions of this thesis are as follows:

1. In auditing accounting estimates embodied in financial statements, what effect (if any) do analytical review results have on deciding the amount of audit effort?
2. In using analytical review results for auditing accounting estimates accounts, what effect (if any) does optimism have on judging the amount of audit effort?
3. In using analytical review results for auditing accounting estimates accounts, what effect (if any) do patterns-for-coping have on judging the audit effort?

4.2 Usefulness of Analytical Review Results

4.2.1 Hypothesis 1: Analytical review results and audit effort: The interplay of “*Auditing Accounting Estimates*” standard with the standard of “*Analytical Review Procedures*” improves the auditor's effectiveness in detecting misstatements (Callahan et al., 1988). Further, according to Section 5305 (CICA, 1996), the auditor is required to obtain sufficient appropriate evidence when assessing the significant estimates management made in the financial statements. This Section provides guidance to auditors on obtaining and evaluating sufficient competent evidential matter to support significant accounting estimates in an audit of financial statements. However, the auditor is challenged with an ill-structured task that requires practising a judgmental process in the function of gathering convincing evidence. Thus, the issue of indirect or circumstantial evidence can come to play an important role in such a situation, which is discussed by Keenan (1979) in that when there is no direct support for one fact its existence must thus be inferred from another fact. The literature encourages the use of the rational argumentation or inference in many cases when it provides the only evidence available to the auditor. Gary (1991) points out that although we have only a weaker grade of evidence, it must be considered as primary evidence as no better evidence exists.

Changing what auditors do will mean exploring ways of improving the quality of audit evidence obtained on accounting estimates. To some extent, it is useful to challenge the traditional notions about what constitutes sufficient appropriate audit evidence and how to go about obtaining it. In many cases, the primary source of evidence for accounting estimates is enquiry of management. Traditionally, this type of evidence has

not been considered very reliable because it tends to be unsubstantiated and originates from the entity. The auditor is often unable to corroborate such enquiries by gathering additional evidence that, according to Section 5300 (CICA, Handbook), would be considered more reliable by virtue of its nature and source. Section 5300 hints at such an approach when it discusses the need to corroborate enquiries made. Paragraph 5300.26 states that "a response from a person within the entity does not usually constitute sufficient appropriate audit evidence in itself but requires corroboration." Hence, it is meaningful to consider some other corroboration, which may include the assessment of the inherent risk for the entity as a whole. This may indicate inconsistencies in actions by the management in preparing the accounting estimates with the financial situation of the company. Callahan et al. (1988, p.66) indicate that based on the understanding of the internal control structure and the assessment of audit risk, the auditor may identify certain accounting estimates as significant risk areas and extend audit procedures in those areas. For instance, if the analytical review results indicate that the company experiences distress or errors, the auditor must expand his effort in investigating accounting estimates, which are susceptible to misstatements in such situations. Asare and Davidson (1995) provide insights into how variations in control procedures (control risk) and financial condition (inherent risk) affect auditors' anticipations of errors in various account balances. As a result, it is expected that analytical review results (ARRs) might function as a gauge in perceiving the fairness of the accounting estimates. When these results signal fluctuations, the auditor may infer that accounting estimates are most likely misstated, as is expressed in the following hypothesis:

H1: Auditors receiving ARR_s signalling fluctuations will allocate more hours to testing accounting estimates than auditors receiving ARR_s signalling no fluctuations.

4.2.2 Hypothesis 2: Analytical review results and conservatism: It is presumed that auditors read through all or portions of the case, and conduct a preliminary analytical review to identify audit problems (i.e., areas of potential audit concern) or audit opportunities (i.e., areas of little audit concern). Therefore, analytical review is used as a diagnostic tool to help direct the audit function. In terms of the problems and opportunities the auditors identified, the inquiry is whether auditors use analytical review as presumed to identify both areas that should be subjected to increased audit effort (problems) and areas that can be subjected to reduced audit effort (opportunities). Biggs et al. (1988) found that there is no evidence that any of the auditors used analytical review to identify areas where audit effort could be reduced. Moreover, there were some areas that showed no unusual fluctuations and, thus, might have been viewed as an area where further tests of details could be reduced. While not conclusive, there is no evidence that auditors used analytical review to identify opportunities to reduce audit effort. The researchers in the mentioned study concluded that it is difficult to determine if this is purely a case-specific finding or whether auditors simply do not get enough “comfort” from the analytical review procedures to reduce more traditional audit tests. Such a conservative trend may reflect the audit training that emphasizes conservative judgements (Cohen and Kida, 1989, p. 264). In this respect, Joyce and Biddle(1981a) and Kida(1984) in their tests of heuristics used in auditing contexts, reveal that auditors' decisions do not always coincide with heuristics developed in the psychological literature. In terms of auditing accounting estimates, the auditors' adoption of conservative judgements

may lead to the conclusion that analytical review results play the role of red flags. Libby (1985) describes the judgement process used in analytical review as a diagnostic process. This is because the auditor makes analytical review judgements by generating a hypothesized cause for an unusual financial statement fluctuation and uses it to guide his/her search for further information.

In the following hypothesis (H2), a conservatism tendency is tested by comparing the hours allocated by the auditors to the hours given in the preliminary audit plan. For this purpose the case material in this study indicated that in the past the audit engagement has seldom produced major auditor/client disagreements. After consulting prior year's audit files and general discussion with management, the auditor in charge prepared the budgeted time for the planned audit procedures for three accounting estimates. Therefore, it is likely that the auditors conclude that, in the case of this year's no fluctuations scenario, the financial statements are fairly presented. Generally, this may lead to the believe that audit hours for this case should be reduced since the risk, according to the analytical review results, is low. However, the matter for auditors is expected to be different. The conservatism phenomenon potential role is likely to surface in audit judgement for accounting estimates. Therefore, the following hypothesis is constructed as:

H2: All else equal, while auditors receiving ARR's that signal fluctuations are likely to increase audit effort, auditors that receive ARR's signaling no-fluctuations are not likely to decrease the planned audit hours.

4.3 Moderating Effects of Psychological Individual Differences

4.3.1 Hypothesis 3: Optimism and audit effort: Scheier and Carver's (1992) research findings suggest that differences in outcomes derive partly from differences between optimists and pessimists in the manner in which they cope with the challenges in their lives. Optimists differ from pessimists in their stable coping tendencies (Carver et al., 1989). A general characterization of the research findings is that optimists tend to use more problem-focused coping strategies than do pessimists. Auditors are more likely to deal with stressful encounters by using problem-focused strategies such as formulating action plans, and keeping their minds on the task at hand. There is also evidence that optimistic people are better at reading environmental cues, selecting situations and tasks that they can control, and make better use of the information (Janoff-Bulman, 1989).

This leads us to hypothesize that optimistic auditors will take advantage of the analytical review results signals (fluctuations) as a motivation to exert more effort (audit hours) on the task of auditing accounting estimates. In contrast, pessimistic auditors are anticipated to be radically conservative. They are inclined to increase audit effort (audit hours) more than optimistic auditors in any case (analytical review results signal fluctuations or no fluctuations):

H3: Given ARR's signaling fluctuations, pessimistic auditors are more likely than optimistic auditors to increase audit hours planned for tests of details for accounting estimates.

4.3.2 Hypothesis 4: Patterns-for-coping and audit effort: In view that an audit environment is complex and stressful, active coping on the part of auditors would be expected. Auditors are necessitated to be vigilant in dealing with (auditing accounting estimates) by using problem-focused strategies such as searching painstakingly for relevant information and assimilate such information in an unbiased manner to infer corroborating evidence. More vigilant auditors will benefit from the signals, which become visible through the analysis of analytical review results. In contrast, less vigilant auditors may compromise by not giving the required level of attention to all available information for different reasons (e.g., time constraints). They are prone to cope with the situation by uncritically adopting whichever new course of action is most salient or most strongly recommended, impulsively seizing upon hastily contrived solutions that seem to promise immediate relief, or constructing wishful rationalizations to bolster the least objectionable alternative. Thus, the hypothesis is:

H4: Given ARR's signalling fluctuations, highly-vigilant auditors are more likely than less-vigilant auditors to increase audit hours planned for tests of details for accounting estimates.

4.4 Experience Effect

4.4.1 Hypothesis 5: Experience effect and audit effort: The impact of experience on audit judgements has been investigated in a number of judgement contexts with mixed results (e.g., Hamilton and Wright, 1982; Cohen and Kida, 1989; Frederick, 1991; Davis, 1996). However, among others Abdolmohammadi and Wright (1987) suggest that experience will play a greater role when the judgement is not well structured or is more

complex. In this regard, the use of analytical review is not a well-structured task, also it involves both an understanding of the complex interrelationships between account balances and an understanding of the link between analytical review results and the extent of audit testing. Cohen and Kida (1989) provided evidence that experienced auditors acquired and evaluated information for analytical review in a different manner from inexperienced auditors. Therefore, generalizability of an experience effect in analytical review judgements deserves investigation. Since the task in this study is complex and not well structured, the following hypothesis is developed:

H5: Given ARRs signalling fluctuations, inexperienced auditors are more likely than experienced auditors to increase audit hours planned for tests of details for accounting estimates.

CHAPTER V

RESEARCH DESIGN

5.0 Overview

The study used a 2x2x2 factorial design with one environmental factor (analytical review results) and two dimensions of individual psychological differences (optimism and patterns-for-coping). The environmental factor was manipulated at two levels (fluctuations versus no-fluctuations), with subjects being randomly assigned to each level. Assignment of subjects to each of the levels relating to individual psychological differences dimensions (optimism versus pessimism; and highly-vigilant versus less-vigilant) was done on the basis of their scores on these dimensions. Subjects comprised a mix of practising auditors from different firms (Big-six and non Big-six), with different levels of auditing experience. They were presented with a case adapted from Kaplan and Reckers (1995), which included, among other information, the financial statements and analytical review indicators along with accounting estimates notes. Subjects were asked to estimate, on the basis of the information provided, the audit hours needed for each accounting estimate. They also were required to respond to the instrument of the Life-Orientation-Test (Scheier & Carver, 1985) for measuring optimism trait and the instrument of the Melbourne Decision Making Questionnaire which was developed by Mann et al. (1997) for measuring vigilance level. A

pre-test was conducted regarding the reliability of the latter instrument. The following sections provide a description of the research design in greater detail.

5.1 The Case

The case was adapted from Kaplan and Reckers (1995). Modifications made to the case included the changing of the names used in the case, changing the dates (to reflect greater recency), and re-arranging the information under new sub-headings (see appendices A and B for a sample of the case material). The Kaplan and Reckers (1995) case was utilized for the study because of its suitability. Specifically, although the company in the case did some misstatements of accounting estimates, it had a history of satisfactory performance. Indicators of possible misstatements are available in the case material. However, through investigating the analytical review results, these misstatements are obvious. This fact enhances the complex nature of the case. Making the task requiring considerable judgement, thus allowing for potential variations in subjects' responses. Using a case incorporating a real-world firm with a known outcome also allowed for gauging decision performance in terms of decision accuracy.

The manipulation with respect to analytical review results was carried out according to the fluctuations and no-fluctuations in the unadjusted balances in financial statements. Selected ratios manifest the financial statements' condition of the under-audit year compared with two previous audited years and with the industry's ratios of the under-audit year. The ratios for the two previous years and the industry were kept the same for the two treatment groups, however the under-audit year's ratios were manipulated to reflect the financial statements' condition of either fluctuations or no fluctuations. In addition, some

specific information regarding the variations in some accounting estimates was given accompanying the ratios. According to the type of information (ratios indicate fluctuations and ratios indicate no fluctuations), subjects were assigned randomly to each of the two (environmental variable-related) treatment groups.

5.2 The Accounting Estimates Notes

During the conduct of the audit, several adjustments were proposed as described in the case. The proposed adjustments are for the smallest amounts, which would bring the recorded accounting estimates within the range considered reasonable, based on the audit staff's analyses. The client's managers however, have rejected each of the adjustments when proposed by the auditor on the grounds that they all relate to accounting estimates that they believe reasonable. The information regarding the proposed adjustments is disclosed as accounting estimates note for the three accounting estimates assertions that considered in the case material for this study.

5.3 Pre-test Procedures

Pre-test procedures were carried out with a view to ascertaining the judgements of a number of subjects on the validity of the case. The test was conducted in the environment of internal control conditions. Internal control conditions were manipulated as strong or weak. For the strong condition, the questionnaire indicated that the compliance testing found that the controls were in place. For the weak condition, a number of weaknesses were specified to indicate a weak control structure. Therefore, four treatment groups were initiated, analytical review results were manipulated over two types

(fluctuations versus no-fluctuations) and two environments of internal control were provided (weak versus strong). The subjects were graduate-level university students. They were provided with a case material (identical to the case of this study), and were asked to assess the initial budgeted time for the audit planning procedures needed for testing accounting estimates accounts. Decisions were evaluated in terms of the number of hours allocated to each account. The results of this test indicate that manipulating analytical review results and internal control conditions significantly affected modifications rendered to planned audit work for accounting estimates. Moreover, subjects used analytical review to extend testing when it signalled problems but were reluctant to reduce testing below a preliminary audit plan when analytical review results signalled account balances were in order. Also, internal control conditions had a greater effect on the subjects' judgements. This means that subjects are inclined to increase audit hours even if analytical review results signal no fluctuations. This is because of the weak condition of internal controls, which has a significant effect on the subjects' judgements. Therefore, in the case material of this study it is hypothesized that internal control condition of the firm is competent to observe the effect of analytical review results variable as moderated by the individual psychological differences.

In addition, another test was performed to support the validity of the vigilance scale. Subjects were asked to answer the questions reported in the instrument of the Melbourne Decision Making Questionnaire which was developed by Mann et al. (1997). The questionnaire contains six questions. Each of these questions pertains to a step in sound decision making, such as defining goals, collecting information, considering alternatives, and checking alternatives. The participants were required to respond to the instrument scale, which calibrated from 10 ("true for me") to 1 ("not true for me"). According to the

comparison between respondents' means and the scale mean, subjects were classified into highly-vigilant and less-vigilant. The difference between the means of the two groups was statistically significant.

5.4 Subjects

The subjects were a mix of practising auditors from both Big Six as well as non-Big Six firms located in different Canadian provinces. Auditors of two different levels of experience, less than 3 years and three years or more, were enlisted in the study to evaluate the possible effects of audit experience. Based on Abdolmohammadi and Wright (1987) audit experience differences might be expected because auditing accounting estimates is an ill structured task. The two groups were selected because their responsibilities related to auditing accounting estimates differ. The literature indicates that accounting estimates are initially reviewed by the senior audit in charge of fieldwork. The senior audit may also propose audit adjustments, if needed. Audit managers, however, have primary responsibility for evaluating questionable accounting estimates and determining whether a proposed audit adjustment needs to be booked. Of the participants, 40 were auditors with less than 3 years of experience and 63 were auditors with three or more years of experience.

5.5 Administration

The method that has been used in this thesis for collecting data is the field experiment. This method presents an attempt to capture more of the realism of actual settings in order to improve the strength of experimental effects, and the degree of generalizability by using more representative subjects, tasks, environments. The field

experiment offers an occasion for manipulating the independent variables and some degree of randomization. It is particularly appropriate for researching problems directly concerned with complex socio-economic and real-life situations (Abdel-khalik and Ajinkya, 1979).

Therefore, audit firms in the Montreal area were personally visited by the researcher. Firms that expressed an interest in participation were provided with as many questionnaires as they requested. These questionnaires were submitted to the mail office in each firm. Then the person who was responsible for the mail instantly distributed these questionnaires to the auditors' mailboxes. Audit firms located across Canada were searched through World Wide Web sites to find the necessary number of practicing auditors. Questionnaires were then mailed to each auditor personally. The two versions of the case (relating to the two experimental groups) were arranged in a repetitive sequence. The necessity of the random assignment of subjects to each treatment group was emphasized, as was the need to complete the experimental task purely on an individual basis. Four weeks after receiving the questionnaires, participants received a reminder letter soliciting their participation. After having completed the task, subjects returned the entire case material in a self-addressed and pre-stamped envelope to the researcher. Since subjects were not required to identify themselves anywhere on the case material, their confidentiality was assured.

A total of 345 questionnaires were distributed to participants. Audit firms in Montreal were provided with 143 questionnaires, and 202 questionnaires were mailed to auditors who work in audit firms outside Montreal. A total of 110 questionnaires were received, 7 questionnaires were not usable because the participants returned them without responses. The reason for this being that these participants had not been practising auditing

for a long enough time. The remaining 103 questionnaires have been used in the statistical analysis.

5.6 The Task

Each subject received a booklet containing a covering letter, the experimental materials, and a debriefing questionnaire and separate instruments. The covering letter instructed participants to role-play the final decision-maker in his/her evaluations pertaining to three staff-proposed audit adjustments to which the client was resistant. The client was described as a publicly traded company that manufactures a variety of large and small products for industrial application. The materials that the subjects received included three types of information: (1) two years of audited financial statements, this year's unaudited account balances, and notes of three types of accounting estimates included in the financial statements, (2) analytical review results (selected ratios for the three years of the company and the current year for the industry), and (3) a list of given audit hours allocated to each accounting estimate balance in the case of adequate internal control structure. With the exception of information about specific accounting estimates assertions, the background information was held constant.

In addition, each of the three proposed adjustments was detailed in an individual paragraph. The proposed adjustments concerned changes in the estimates of the allowance for doubtful accounts, the useful lives of equipment, and the amount of obsolete inventory. Each adjustment would decrease net income. The amount of each adjustment was over 5 per cent of net income. Thus, when considered individually, the amount of the proposed adjustment compared with net income might be considered materially relevant. The

subjects' task was to make a decision regarding whether the proposed adjustments would need the audit plan hours to be adjusted according to the analytical review signals. Their judgements were required concerning the modification of the initial budgeted time for the planned audit procedures. If modifications were required the subjects were asked to fill in the revised budgeted time for each of the three accounts. In addition, they were asked to indicate how confident they were in the revised budgeted time on a scale from 0 ("No confidence") to 10 ("Full confidence"). Further, they were asked to indicate their level of experience and their gender.

The instruments included in this case were for measuring the optimism and patterns-for-coping dimensions for each subject on two different scales.

5.7 The Variables

Three independent variables (one environmental and two individual psychology-related) were examined in the study. The environmental variable was analytical review results; the individual psychology variables were optimism and patterns-for coping. In addition, the dependent variable was audit effort (allocated audit hours).

5.7.1 Independent Variable (Analytical Review Results): Analytical review results variable was manipulated at two levels: fluctuations and no-fluctuations in the unadjusted balances in financial statements. The fluctuation involved an overstatement or understatement due to specific reasons. The analytical review results entail trends and ratios of the company to provide an indication on the condition of the financial statements. In this regard, a number of selected ratios were presented in the case material. These ratios manifest

the financial statements' condition of the under-audit year compared with two previous audited years and with the industry's ratios of the under-audit year. The ratios for the two previous years and the industry were kept the same for the two treatment groups, however the under-audit year's ratios were manipulated to reflect the financial statements' condition of either fluctuations or no fluctuations. In addition, some specific information regarding the variations in some accounting estimates was given accompanying the ratios. According to the type of information (ratios indicate fluctuations and ratios indicate no fluctuations), subjects were assigned randomly to each of the two (environmental variable-related) treatment groups.

5.7.2 Moderating Variables

5.7.2.1 Optimism: optimism trait was manipulated at two levels: optimists and pessimists. Subjects were asked to answer the questions reported in the instrument of the Life-Orientation-Test (Scheier & Carver, 1985). According to their answers, subjects were divided into optimists and pessimists. The developed version of the LOT instrument (appendices 1 and 2) consists of eight items, plus four filler items that were included in order to disguise (somewhat) the underlying purpose of the test. Of these eight items, four are keyed in a positive direction, and four are keyed in a negative direction. Respondents are asked to indicate the extent to which they agree with each of the twelve items, using the following response format: 4 = strongly agree, 3 = agree, 2 = neutral, 1 = disagree, and 0 = strongly disagree. All negatively worded items are reversed prior to scoring.

The researchers (Scheier and Carver, 1985) who developed the LOT scale have conducted the Cronbach alphas test for the scale if individual items were removed. The test

suggests that each of the items is at least partially measuring the same underlying construct, but not to such an extent that any one of the items is overly redundant with the others. Cronbach's alpha for the entire eight-item scale was 0.76. Overall, the LOT seems to exhibit an acceptable level of internal consistency. The other reliability issue is concerning the stability of individual scores over time. A separate sample of a number of respondents was asked to complete the scale twice, with a 4-week interval between administrations. The test-retest correlation was 0.79, suggesting that the LOT possesses reasonable stability across time.

5.7.2.2 Patterns-for-Coping (Vigilance): Patterns-for-coping cognitive complexity was manipulated at two levels: highly-vigilant and less-vigilant. Subjects were asked to answer the questions reported in the instrument of the Melbourne Decision Making Questionnaire which was developed by Mann et al. (1997). Accordingly, subjects were classified into highly-vigilant and less-vigilant. The questionnaire consists of six items each relating to a step in sound decision making, such as defining goals, collecting information, considering alternatives, and checking alternatives. The respondents were asked to respond to the instrument scale, which was calibrated from 10 ("true for me") to 1 ("not true for me"). The integrity of the vigilance scale is worth noting, as the scale is constructed of six items, each corresponding to a characteristic/feature of vigilant information processing as described by Janis and Mann (1977). The good reliability of the vigilance scale ($\alpha = 0.80$) provides justification for its use in decision making research.

5.7.3 Experience Impact: For testing the impact of experience, two levels of experience were used. The classification of the auditors to either level was adopted from Biggs et al (1988) study. Auditors were considered as experienced when they have three years of experience or more in the audit field and considered as inexperienced when they have less than three years of audit work.

5.7.4 Dependent Variable (Planned Audit Hours): The dependent variable for the study was the audit hours allocated to the audit plan. The subjects examined the basic audit plan (typical plan) regarding accounting estimates assertions in the light of the independent variable. Correspondingly, the audit hours allocated to auditing accounting estimates were increased or decreased according to the subject's judgement of the financial information. These increased or decreased hours (audit effort) represent the variation in the dependent variable.

5.8 Analysis

Analysis of the subjects' responses was carried out using a 2 (fluctuations versus no-fluctuations) x 2 (optimists versus pessimists) x 2 (highly-vigilant versus less-vigilant) full factorial analysis of variance (ANOVA) technique. Univariate t-tests were also utilized to test for significant differences between group means on the different dimensions tested.

Inasmuch as the main concerns of most audit judgement research are between-subjects' consensus and the relative importance of individual cues in the judgement process, it is worthy for these issues to be addressed by building models of relationships between cues and judgements. This process is often called *policy capturing*. Further, in the real

settings these cues are likely to be interrelated (multicollinearity). This problem clouds the inferences concerning the relative importance of different cues that may be drawn from the cue utilization coefficients. This has led many researchers to abandon using the regression and turn to a similar method, which is called analysis of variance (ANOVA).

The applications of analysis of variance have been concerned solely with modelling the individual's judgement process, instead of evaluating judgement accuracy. For purposes of experimental expediency, analysis of variance studies typically employ a small number of discrete levels of each cue. In fact, many such studies have employed only two cue levels, e.g., "high" and "low" (Ashton, 1982). Within this approach a significant main effect for a particular cue implies that the individual's responses varied systematically with the levels of that cue. Similarly, a significant two-factor interaction implies that the individual responded to patterns of cue levels, i.e., that the effect on judgements of one cue differed as a function of the level of the other cue. An indication of the extent to which the individual relies upon the cues, both individually and in combination with one or more other cues, can be obtained by computing significance statistics (e.g., F ratios).

The following chapter presents the results of the data analysis, as well as a discussion of the findings.

CHAPTER VI

RESULTS

6.0 Overview

The dependent measure of interest is total hours (TOTALHRS) which auditors allocated to the budgeted time for the audit planning procedures for three accounts of accounting estimates. The independent variables are analytical review results (ARRs) (i.e., signalling either fluctuations or no-fluctuations), personality traits of the auditors (i.e., either optimistic or pessimistic), and pattern-for-coping that is adopted by auditors (i.e., either highly-vigilant or less-vigilant). The former variable is environment-related, and subjects were randomly placed in one of two treatment groups.

To introduce the subjects' individual psychological differences (personality traits and patterns-for-coping) in the analysis, the sample was split into four groups on the basis of individual average optimism scores and individual average pattern-for-coping scores, forming two new dichotomous variables, OPTIMISM and VIGILANCE. Subjects with optimism scores below the mean of the LOT score were assigned to the pessimists group, while those with scores above the LOT score mean were assigned to the optimists group. With respect to the vigilance variable, the subjects were divided according to their vigilance score. Subjects with vigilance scores below the mean of the Melbourne Decision Making Questionnaire score were assigned to the less-vigilant group, while those with scores above

the Melbourne Decision Making Questionnaire score mean were assigned to the highly-vigilant group.

6.1 Statistical Analysis

Descriptive statistics for the two environmental-variable related treatment groups (Fluctuations and No-fluctuations) are presented in table 2. The table presents the means and standard deviations of allocated audit hours for the audit plan as a whole and for each of the three accounts, and the subjects' confidence level. The findings indicate that subjects in the group (No-fluctuations) are confident (mean 82.08%, s.d. 18.68) that audit hours planned need to be changed by a small amount (mean 15.04 hours, s.d. 3.07) compared with the planned 13 hours (obsolete inventory allowance 5 hours, allowance for doubtful accounts 4 hours and depreciation for fixed assets 4 hours). Most of the subjects (30 subjects 62.5%) in this group have not changed the planned hours. However, for the rest (18 subjects 37.5%) the individual psychological differences may cause them to slightly increase the budgeted hours. In the other treatment group (Fluctuations) subjects are confident (mean 73.45%, s.d. 15.66) that budgeted audit hours need to be increased according to the existence of unusual fluctuations. They believe that the hours for investigating accounting estimates need to be increased to (mean 19.45, s.d. 3.41). The difference between the two means 15.04 and 19.45 hours is statistically significant ($t = -6.899$, $p = 0.000$). These statistics suggest that audit tasks with analytical review procedures resulting in fluctuations in financial statements bring about some skepticism in the auditor's view toward the management's preparation of accounting estimates, which motivates him/her to exert more effort.

Subjects who participated in the study were females and males at two levels of audit experience. Table 3 describes the actual numbers of the participants in each treatment group. It exhibits that 40 (39%) subjects are auditors with audit experience less than 3 years [22 (21%) were in the fluctuations treatment group and 18 (18%) were in the no-fluctuations treatment group]. The remainder 63 (61%) subjects are auditors with audit experience 3 years or more [33 (32%) were in the fluctuations treatment group and 30 (29%) were in the no-fluctuations treatment group].

Table 2

Descriptive statistics for audit hours assigned to audit plan and subject's confidence in her/his allocation [means (standard deviations)]

Treatment Group	N	Assigned Hours for Audit Plan				Confidence Level
		Obsolete Inventory	Doubtful Accounts	Depreciation	Total Hours	
Fluctuations	55	7.83 (1.74)	5.95 (1.19)	5.61 (1.19)	19.45 (3.41)	73.45 (15.66)
No-Fluctuations	48	5.62 (1.28)	4.58 (1.30)	4.83 (1.40)	15.04 (3.07)	82.08 (18.68)

The table also shows the gender of the participant in each treatment group. Forty-eight (47%) subjects are females [24 (23.5%) were in the fluctuations treatment group and 24 (23.5%) were in the no-fluctuations treatment group]. The rest of the subjects 55

(53%) are males [31 (30%) were in the fluctuations treatment group and 24 (23%) were in the no-fluctuations treatment group].

Table 3

Distribution of participants according to their level of audit experience and gender

Treatment Group	N	Level of Audit Experience		Subject's Gender	
		No. of Subjects Less Than 3 Years	No. of Subjects Three Years or More	Female	Male
Fluctuations	55	22	33	24	31
No-Fluctuations	48	18	30	24	24
Total	103	40	63	48	55

6.2 Tests of Hypotheses

H1 predicts that auditors receiving analytical review results signalling fluctuations will allocate more hours to testing accounting estimates than auditors receiving analytical review results signalling no-fluctuations. Subjects in each treatment group were asked to specify their revised budget time (audit hours) for the audit planning procedures for each of the three accounting estimates. The responses of subjects in the Fluctuations group (subjects who received analytical review results signalling fluctuations) were expected to modify the initial audit plan (13 hours) by allocating more hours. Means and standard deviations for the audit hours for each of the three accounts in this group indicate that subjects are prone to

spend more hours for tests of details of accounting estimates whenever the ARR_s signal the existence of fluctuations. Panel A of table 4 shows the results of t-test for differences between fluctuations and no-fluctuations groups relating to audit hours allocated to audit plan ($t = -6.899$, $p=0.000$). These results are consistent with expectations. H1 also was tested with analysis of variance (ANOVA) carried out with analytical review results (ARR_s) as the independent variable and audit hours (TOTALHRS) as the dependent variable. Panel B of table 4 indicates that ARR_s were found to be highly significant ($F = 46.909$, $p=0.000$). The results therefore provide strong support for H1.

In addition, these results illustrate that auditors are willing to extend audit work for accounting estimates (compared to the given audit plan) when analytical review results signal fluctuations but they are not willing to reduce audit work for accounting estimates when analytical review results signal no-fluctuations. This raises the potential role of conservatism in audit judgment. An examination of tables 2 and 4 shows that for the best case scenario of analytical review results signaling no-fluctuations the subjects maintained the initial audit plan (13 hours) without any changes or made only small changes. The finding that participants used analytical review results to extend but not reduce testings supports the conservatism tendency found in the literature (Biggs et al., 1988 and Cohen and Kida, 1989). This result is consistent with the view that auditors are different from other subjects. Therefore, the conservatism hypothesis H2 was supported.

Table 5, panel A presents the results of t-test for differences between optimists and pessimists within the no-fluctuations group relating to audit effort (hours allocated to audit plan). These results provide an indication that pessimistic auditors (mean 16.05, s.d.

3.49) are inclined to allocate more hours than optimistic auditors (mean 14.32, s.d. 2.55) even in the case of accounting estimates accounts containing no fluctuations. The t-value for the difference between these two personality traits is 1.885 with p -value=0.068, which means that the difference is marginally significant. In this regard, hypothesis 3 is concerned with the expected effect of optimism (pessimism) on the auditor's judgment.

Table 4

Panel A: Results of t-test for differences between the fluctuations and no-fluctuations groups relating to audit effort (hours allocated to audit plan)					
Group	N	Mean	S.D.	t-value	Sig.
Fluctuations	55	19.45	3.41	-6.899	0.000
No-fluctuations	48	15.04	3.07		

Panel B: Results of analysis of variance for differences between the fluctuations and no-fluctuations groups relating to audit effort (hours allocated to audit plan)					
Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	497.072	1	497.072	46.909	0.000
ARRs	497.072	1	497.072	46.909	0.000
Residual	1070.253	101	10.597		

It asserts that optimistic auditors are likely not to change the planned audit hours to tests of details for accounting estimates in the case of ARR's embodying no-fluctuations (but pessimistic auditors are likely to increase the planned audit hours). Panel B of table 5 implies that subjects in the treatment group with no-fluctuations accounts perceive either

no change or small change (increase) in planned audit hours. The analysis of variance of between subjects effects indicates that the hypothesis is marginally supported ($F = 3.939$, $p=0.053$).

Table 5

Panel A: Results of t-test for differences between optimists and pessimists within the no-fluctuations group relating to audit effort (hours allocated to audit plan)

Group	N	Mean	S.D.	t-value	Sig.
Optimists	28	14.32	2.55	1.885	0.068
Pessimists	20	16.05	3.49		

Panel B: Results of analysis of variance for differences between optimists and pessimists within the no-fluctuations group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	34.860	1	34.860	3.939	0.053
OPTIMISM	34.860	1	34.860	3.939	0.053
Residual	407.057	46	8.849		

Hypothesis 3 also predicts that when ARR's embody fluctuations settings, optimistic (pessimistic) auditors are likely to increase planned audit hours. However, pessimistic auditors will add greater hours than optimists. Table 6, panel A presents the results of t-test for differences between optimists and pessimists within fluctuations group relating to audit effort (hours allocated to audit plan). The panel provides the signal showing that pessimistic auditors (mean 20.48, s.d. 3.17) allocate greater hours than optimistic auditors (mean 18.70, s.d. 3.43). The t-test for the difference between these

two personalities is statistically significant at a level of 10% ($t = 1.978, p = 0.054$). Panel B of table 6 illustrates another analysis of variance results for hypothesis 3. The analysis shows that both optimistic and pessimistic auditors show an increase in the budgeted time for auditing accounting estimates ($F = 3.813, p = 0.056$). However, through investigating the two panels together, it is evident that pessimistic auditors allocate greater hours than optimistic auditors do which supports hypothesis 3.

Table 6

Panel A: Results of t-test for differences between optimists and pessimists within the fluctuations group relating to audit effort (hours allocated to audit plan)					
Group	N	Mean	S.D.	t-value	Sig.
Optimists	32	18.70	3.43	1.978	0.054
Pessimists	23	20.48	3.17		

Panel B: Results of analysis of variance for differences between optimists and pessimists within the fluctuations group relating to audit effort (hours allocated to audit plan)					
Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	42.168	1	42.168	3.813	0.056
OPTIMISM	42.168	1	42.168	3.813	0.056
Residual	586.169	53	11.060		

Table 7, panel A presents the results of t-test for differences between less-vigilant and highly-vigilant auditors within the no-fluctuations group relating to audit effort (hours allocated to audit plan). These results provide indications that highly-vigilant auditors (mean 15.77, s.d. 3.32) are more willing to assign greater hours in the case where

accounting estimates accounts contain no fluctuations. However, less-vigilant auditors show very small change in the budgeted audit hours (mean 13.83, s.d. 2.18). The t-test for the difference between these two patterns-for-coping is statistically significant ($t = -2.435$, $p = 0.019$). Panel B of table 7 indicates that when accounting estimates accounts signal no fluctuations auditors differ in their view to planned audit hours according to their patterns for coping ($F = 4.837$, $p = 0.033$). This means that less-vigilant auditors are not willing to change the plan, however highly-vigilant auditors are ready to increase the number of hours in the audit plan. These results are consistent with the essence of hypothesis 4 which predicts that in the settings of ARRs embody no-fluctuations, planned audit hours, to tests of details for accounting estimates, for less-vigilant auditors are likely not to be changed (but are likely to be increased for highly-vigilant auditors).

Table 7

Panel A: Results of t-test for differences between highly-vigilant and less-vigilant within the no-fluctuations group relating to audit effort (hours allocated to audit plan)

Group	N	Mean	S.D.	t-value	Sig.
Highly-Vigilant	30	15.77	3.32	-2.435	0.019
Less-Vigilant	18	13.83	2.18		

Panel B: Results of analysis of variance for differences between highly-vigilant and less-vigilant within the no-fluctuations group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	42.050	1	42.050	4.837	0.033
VIGILANCE	42.050	1	42.050	4.837	0.033
Residual	399.867	46	8.693		

Furthermore hypothesis 4 anticipates that less-vigilant (highly-vigilant) auditors are likely to increase planned audit hours in fluctuations settings. However, highly-vigilant auditors will add a greater number of hours than less-vigilant auditors. Table 8, panel A exhibits the results of t-test for differences between these two patterns for coping within the fluctuations group relating to audit effort (hours assigned to audit plan). The panel indicates that highly-vigilant auditors (mean 19.76, s.d. 3.35) devote greater number of hours than less-vigilant auditors (mean 18.93, s.d. 3.53). The t-test for the difference between these two patterns is not statistically significant ($t = -0.870$, $p = 0.389$). This means that the two groups of auditors were almost the same in their estimations for the revision of budgeted audit time for accounting estimates. Panel B of table 8 shows ANOVA results for hypothesis 4 in the fluctuations case. The analysis reveals that both highly-vigilant and less-vigilant auditors show an increase in the budgeted time for auditing accounting estimates ($F = 0.777$, $p = 0.382$). However, this increase in the audit hours is almost the same for both groups, which reflects the low value and thus insignificance of the F statistic. Therefore, the results of analyses of variance do not support hypothesis 4.

Table 8

Panel A: Results of t-test for differences between highly-vigilant and less-vigilant within the fluctuations group relating to audit effort (hours allocated to audit plan)

Group	N	Mean	S.D.	t-value	Sig.
Highly-Vigilant	34	19.76	3.35	-0.870	0.389
Less-Vigilant	21	18.93	3.53		

Panel B: Results of analysis of variance for differences between highly-vigilant and less-vigilant within the fluctuations group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	9.076	1	9.076	0.777	0.382
VIGILANCE	9.076	1	9.076	0.777	0.382
Residual	619.261	53	11.684		

Table 9, panel A shows the results of t-test for differences between experienced and inexperienced auditors within the no-fluctuations group relating to audit effort (hours allocated to audit plan). These results provide an indication that experienced auditors (mean 14.97, s.d. 3.18) are ready to slightly increase the hours in the case of accounting estimates accounts contain no fluctuations. In addition, inexperienced auditors show approximately the same change in the budgeted audit hours (mean 15.17, s.d. 2.96). The t-test for the difference between these two groups is not statistically significant ($t = 0.221$, $p = 0.827$). Panel B of table 9 indicates that when accounting estimates accounts signal no fluctuations auditors show no difference in their view to planned audit hours according to their experience level ($F = 0.047$, $p = 0.830$). This means that the experience factor has no significant effect in the case of auditing accounting estimates in the

environment of no fluctuations. These results are inconsistent with the essence of hypothesis 5, which predicts that experience level affects the auditors judgements.

Hypothesis 5 also anticipates that experience will affect the auditors' assessments of time budget for accounting estimates in the fluctuations settings. Table 10, panel A exhibits the results of t-test for differences between the two levels of experience within the fluctuations treatment group relating to audit effort (hours assigned to audit plan). The panel gives an indication that experienced auditors (mean 20.03, s.d. 3.50) devote slightly greater hours than inexperienced auditors (mean 18.57, s.d. 3.14). The t-test for the difference between these two levels of experience is statistically insignificant ($t = -1.614$, $p = 0.113$). This means that the two groups of auditors were almost the same in their estimations for the revision of budgeted audit time for accounting estimates. However, although the results are statistically insignificant, there is a different outcome from the no-fluctuations group. In this treatment group (fluctuations) the t-test shows that the results are close to the significance level 10%. This means that there is some possibility that experienced auditors are different from inexperienced auditors in their view to accounting estimates in the context of analytical review results signal fluctuations. Panel B of table 10 shows ANOVA results for hypothesis 5. The analysis reveals that both experienced and inexperienced auditors show an increase in the budgeted time for auditing accounting estimates ($F = 2.492$, $p = 0.120$). However, this increase in the audit hours is almost the same for both groups, which reflects the low value of F statistic and its insignificance. Therefore, the results of this analysis of variance for both of the treatment groups (fluctuations and no-fluctuations) do not support hypothesis 5.

Table 9

Panel A: Results of t-test for differences between experienced and inexperienced within the no-fluctuations group relating to audit effort (hours allocated to audit plan)

Group	N	Mean	S.D.	t-value	Sig.
Experienced	30	14.97	3.18	0.221	0.827
Inexperienced	18	15.17	2.96		

Panel B: Results of analysis of variance for differences between experienced and inexperienced within the no-fluctuations group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	0.450	1	0.450	0.047	0.830
EXPERIENCE	0.450	1	0.450	0.047	0.830
Residual	441.467	46	9.597		

Table 10

Panel A: Results of t-test for differences between experienced and inexperienced within the fluctuations group relating to audit effort (hours allocated to audit plan)

Group	N	Mean	S.D.	t-value	Sig.
Experienced	33	20.03	3.50	-1.614	0.113
Inexperienced	22	18.57	3.14		

Panel B: Results of analysis of variance for differences between experienced and inexperienced within the fluctuations group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	28.219	1	28.219	2.492	0.120
EXPERIENCE	28.219	1	28.219	2.492	0.120
Residual	600.117	53	11.323		

6.3 The Interaction of Analytical Review Results, Optimism, and Vigilance

The results shown in table 11 indicate that there is an interaction effect between optimism and vigilance within each of the two groups (fluctuations and no-fluctuations). Auditors in the fluctuations group exhibit that they are allocating audit hours differently according to their personality traits (optimism) and cognitive characteristics (vigilance). The analysis of variance in panel A of table 11 shows that auditors who are optimist and highly-vigilant are significantly different ($F = 6.393$, $p = 0.017$) from those who are optimist and less-vigilant in their judgements for allocating audit hours to accounting estimates. However, in the same fluctuations group, panel B of table 11 illustrates that pessimist highly-vigilant auditors are making judgements indifferently from pessimist less-vigilant auditors ($F = 0.332$, $p = 0.570$). These results suggest that optimist auditors are making their judgements according to their cognitive characteristics. Yet, pessimist auditors performing their tasks according to their personalities regardless of their cognitive characteristics.

On the other group (no-fluctuations), vigilance variable shows no significant effect on auditors with both personalities (optimism and pessimism). Table 12, panel A indicates that optimist highly-vigilant auditors are not significantly different ($F = 0.600$, $p = 0.445$) from those auditors who are optimist and less-vigilant. Also, panel B shows that pessimist auditors who are highly-vigilant are not significantly different ($F = 1.270$, $p = 0.275$) from pessimist less-vigilant auditors. The results of this table may suggest that all auditors, in the scenario of no fluctuations, are maintaining equivalent perceptions toward the judgement of allocating audit hours to the audit plan for accounting estimates.

Table 11

Panel A: Results of analysis of variance for differences between highly-vigilant and less-vigilant within the no-fluctuations x optimism group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	186.876	1	186.876	6.393	0.017
VIGILANCE	186.876	1	186.876	6.393	0.017
Residual	876.929	30	29.231		

Panel B: Results of analysis of variance for differences between highly-vigilant and less-vigilant within the no-fluctuations x pessimism group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	3.732	1	3.732	0.332	0.570
VIGILANCE	3.732	1	3.732	0.332	0.570
Residual	235.746	21	11.226		

Table 12

Panel A: Results of analysis of variance for differences between highly-vigilant and less-vigilant within the fluctuations x optimism group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	8.257	1	8.257	0.600	0.445
VIGILANCE	8.257	1	8.257	0.600	0.445
Residual	357.600	26	13.754		

Panel B: Results of analysis of variance for differences between highly-vigilant and less-vigilant within the fluctuations x pessimism group relating to audit effort (hours allocated to audit plan)

Source of Variations	Sum of Squares	DF	Mean Square	F	Sig. of F
Corrected Model	14.008	1	14.008	1.270	0.275
VIGILANCE	14.008	1	14.008	1.270	0.275
Residual	198.542	18	11.030		

6.4 Correlation Matrix

Table 13 presents the correlation among various variables. These results show that the major dependent variable (TOTALHRS) is significantly correlated with confidence, analytical review results and optimism. However, it is marginally correlated with vigilance, and statistically significant at level of 10%. This finding advocates that the model for auditing accounting estimates is influenced by analytical review results, optimism and vigilance. In this model the auditors of accounting estimates are highly confident in their allocation of audit hours when they do not change the plan or increase the audit hours by a small amount. However, they are less confident when they assign greater amount of hours. This result also is supported by the significant correlation between confidence and analytical review results. The correlation indicates that when there are no fluctuations the auditors are highly confident in their work, but they are less sure about their judgements when faced by financial statements containing fluctuations. Confidence level is also significantly correlated with experience. Less experienced auditors are less confident in their judgements than experienced auditors. Optimism

shows meaningful association with confidence. Optimistic auditors are firm in their judgements that is reflected by their high level of confidence. On the other side, pessimistic auditors are suspicious and willing to secure more audit hours but they are not sure that their decisions are right. The correlation matrix also indicates no significant correlation between gender and any of the other variables. That means gender plays no role in the context of audit judgement at least in the task of auditing accounting estimates.

Table 13

Variables	Correlation matrix with 2-tailed significance test						
	1	2	3	4	5	6	7
1. TOTALHRS	1.000						
2.EXPERIENCE	0.073	1.000					
3. CONFIDENCE	-0.322	0.375	1.000				
4. GENDER	0.009	0.134	-0.146	1.000			
5. ARRs	0.563	-0.026	-0.246	0.064	1.000		
6. OPTIMISM	0.223	-0.012	-0.339	-0.038	0.002	1.000	
7. VIGILANCE	0.163	0.035	0.105	-0.087	-0.007	-0.029	1.000

CHAPTER VII

CONCLUDING COMMENTS

7.0 Overview

The following sections present the conclusions of the study, its limitations, as well as suggestions for future research. Little research attention has been given to auditors' reporting decisions for accounting estimates. This research regarding the factors to consider when auditing accounting estimates (Wallace, 1993; Smith, 1994; Kaplan and Reckers, 1995) have reported that assessments of management's intentions influence reporting decisions with respect to accounting estimates. The influence may be greater still in the presence of red flags combinations. This study therefore examined the usefulness of analytical review results as red flags in the context of the auditor's personality and cognitive complexity. The theoretical framework supporting the analysis was derived from the cognitive theory of induction outlined by Holland et al. (1986). This inductive-inference theory is based on the premise that people reason by manipulating selected goals and knowledge within the framework of a mental model. Five hypotheses were developed on the basis of this theoretical framework.

7.1 Conclusions

As an outcome of the fact that this thesis represented a preliminary investigation into a complex phenomenon— the influence of optimism and patterns of coping on auditor

judgement— its nature was largely exploratory. It was also constrained by the relatively limited number of subjects. Despite this, some noteworthy results do emerge, permitting the drawing of some conclusions that may guide future research.

These results were (1) subjects' perceptions to extend tests of details related to the balances of the accounting estimates, according to the audit hours allocated to the budgeted time plan, did vary significantly across treatment groups, (2) subjects' confidence in their assignment of the audit effort was influenced by the analytical review results and the two dimensions of the individual psychological differences, (3) subjects have assigned more hours to the audit plan for accounting estimates when analytical review results signaled fluctuations, (4) the conservatism tendency found by Biggs et al. (1988) and corroborated by Cohen and Kida (1989), was found to be valid in this study, (5) optimistic auditors have exploited the environmental information (analytical review results) to conclude the judgment about the accounting estimates, (6) although the significance level was at 10%, highly-vigilant auditors have considered and use the fluctuations in analytical review results in their judgments of accounting estimates, and (7) the examination of the experience effect shows that auditors in both levels of experience made their decisions regarding accounting estimates in almost the same manner for the case of no fluctuations, however, when it came to fluctuations settings they were marginally different from each other. Some plausible explanations of and comments on the reported results are as follows:

First, the outcome that auditors use analytical review results in their mental models to mitigate the cognitive effort for judging the effort required to audit accounting estimates, corroborates the assertions that analytical review results represent a concept of

knowledge to be connected within the model for solving problems. Auditors may interpret these results in the context of the financial statements as a whole. According to the model of induction theory, the auditors use analytical review results to infer the financial situation of the client and the management's integrity as well as whether the client has the intention to manipulate the income. The findings of this study are consistent with Kinney's (1981) suggestion that analytical review procedures perform mainly an "attention-directing" function during audit planning and testing. However, the confidence level in the use of these results and the extent of audit effort allocated indicates that auditors are not all the same. There are some factors that affect the auditors' trust in their judgements. Also, this confidence was affected by the number of audit hours allocated to the budgeted time plan. When the plan needs no change or less hours were allocated, the auditors were more confident in their decisions, however in the case of allocating greater number of audit hours the results show that auditors were not highly confident that their decisions were right. In other words, the auditors were trusting their judgements when the audit plan remains unchanged or slightly changed, however they lost some of this trust when they take the decision to materially increase the planned audit hours.

Second, the finding that participants used analytical review to extend but not reduce testings supports the conservatism tendency found in the literature (Biggs et al., 1988 and Cohen and Kida, 1989). Prior tests of heuristics used in auditing contexts (e.g., Joyce and Biddle, 1981a and Kida, 1984) reveal that auditors' decisions do not always coincide with heuristics developed in the psychological literature. Such differences between audit professionals' judgments and predictions of psychological theories may be due to: (i) audit training that emphasizes conservative judgments, and (ii) auditor's

perspective of possible costs that might emanate from his or her decisions. Further research that analyzes the underlying reasons for the conservatism tendency found here could provide more insight into audit judgments.

Third, the conclusion that subjects allocate audit hours with different perspectives to each account of accounting estimates, provides us with a perception of the risk each account poses to the auditor. In this study auditors believed that allowances for obsolete inventory convey more risk when analytical review results signal fluctuations. The high sensitivity of allowances for obsolete inventory may be interpreted as an indication that this account is more exposed to the management manipulation of the financial statements figures.

Fourth, the arguments indicate that auditors are not consistent with the findings of psychological literature. Auditors' decisions do not always coincide with heuristics developed in psychology. Such a trend may reflect the audit environment and the auditors' training. In this respect, optimistic auditors-in the best scenario (analytical review results signal no fluctuations) were not changing their effort or only change it slightly. However, they were found to take advantage of the analytical review results signals (fluctuations) as an encouragement to exert more effort on the task under audit. They adopt this strategy to satisfy themselves that the situation is controllable and the settlement of the issue is feasible.

In contrast, pessimistic auditors were radically conservative. They were inclined to increase audit efforts more so than optimistic auditors in either case (analytical review results signal fluctuations or otherwise). This tendency reflects the focus on feelings. This group of people is prone to cope by adopting emotion-focused strategies of focusing on stressful feelings (Lee et al., 1993).

Fifth, in view that the audit environment is complex and stressful, auditors were expected to adopt an active coping strategy. This environment necessitates that they be vigilant in dealing with auditing accounting estimates by using problem-focused strategies such as searching painstakingly for relevant information and assimilating such information in an unbiased manner to infer corroborating evidence. Highly-vigilant auditors were benefiting from the signals revealed through the analysis of analytical review results. In contrast, less-vigilant auditors were in the mode of compromising by not giving the required level of attention to all available information for different reasons (i.e., time constraints). However, this use of vigilance characteristic is restricted to the optimist auditors rather than pessimist auditors.

Sixth, the interaction analysis of the personality trait (optimism) and the cognitive variable (vigilance) indicate that optimist auditors are making their judgements according to their cognitive characteristics. Yet, pessimist auditors performing their tasks according to their personalities regardless of their cognitive characteristics. Vigilance variable shows no significant effect on auditors with both personalities (optimism and pessimism) in the case of no fluctuations. These findings suggest that these two variables are interacting with each other in the situation of rendering audit judgement for ill-structured tasks. Therefore, it is beneficial to treat these two dimensions together. Although the psychology literature indicates that there is no conclusive evidence that training is altering optimism and vigilance, other ways are possible for this task. For example, improving the surrounding environment of auditors through promoting the positive social interaction may bring about some changes in the attitudes and views of the auditors toward the future and the work. Another example could be assisting auditors in solving

their personal problems which may supports them in looking to the bright side of the life and directing their concentration to the work to be vigilant and adopt a problem-focused strategies.

Seventh, the impact of experience on audit judgements has been investigated in a number of judgement contexts with mixed results (e.g., Hamilton and wright, 1982; Cohen and Kida, 1989; Frederick, 1991; Davis, 1996). In addition, Abdolmohammadi and Wright (1987) suggest that experience will play a greater role when the judgement is not well structured or is more complex. Nevertheless, the findings of this study present the insignificant effect of the auditors' level of experience. Although auditing accounting estimates and using analytical review results represent an ill-structural task, both levels of auditors may agree on their view of accounting estimates as an area of high risk. This agreement on the view interprets the reduction in the variance between the two levels to a trivial difference when analytical review results reveal fluctuations. Therefore, the cause of the inconsistency with some of the previous research is the audit task itself (auditing accounting estimates). In addition, the classification of auditors to less than three years and three years or more is not an accurate procedure which may biased the findings of this study. This means that the generalizability of an experience effect in analytical review judgements is complex and depends on the nature of the audit task.

Eighth, the previous literature in audit judgement reveals considerable variation in consensus between studies (Solomon and Shields, 1994). According to the findings of this study with respect to the personality traits and cognitive complexity, it is typical for auditors to vary in the process of decision making. Therefore, individual psychological differences play an important role in modelling the behaviour of the decision-maker.

7.2 Limitations of the Study

The study is subject to some limitations. First, it is possible that subjects may not respond to cases under an experimental approach in the same way as they would do in practice. Although the case of this study includes much of the information typically available for performing the task, it is difficult to build in some of the social pressures that might exist in the real world. Second, regarding the use of field experiment method, the practical exigencies and limitations of this method may make it difficult to explicitly manipulate some crucial independent variable(s), and randomization may not be as thorough as that of the laboratory experiment. Finally, a selection bias cannot be ruled out, since participation was entirely voluntary. However, this study did attempt to mitigate the effects of this bias by randomly assigning subjects to each experimental condition. Yet, the study makes a contribution to the literature of auditors' reporting decisions for accounting estimates in the context of analytical review results, as well as the effects of the auditors individual differences on the decisions taken.

Suggestions for Future Research

Future research may analyze the underlying reasons for the conservatism tendency which has been found in this study and previous studies in which auditors used analytical procedures to identify problems and increased the audit effort accordingly, but they did not use these procedures to identify opportunities to reduce audit efforts. This analysis might investigate the reasons behind this occurrence and provide further insights into explaining audit judgments. Is it because auditors need more "solid" evidence before

they will reduce tests of details? If this is the case, then analytical procedures may not provide the increased audit efficiency that has been the hope of many auditors.

This study did provide another avenue of additional research related to the role of experience in various audit tasks. The overall success of auditors (Willingham, 1985) suggests that good decisions predominate in auditing. This does not mean there is no room for improvement, or that judgmental biases are non-existent, but it does suggest that reasonable theories can be based on a systematic knowledge of the way in which experienced auditors make decisions in various task settings.

The other possible path of research that appears from this study is the extent of the usefulness of other dimensions of personality and cognitive complexity in accounting research, such as decision styles and tolerance for ambiguity to see if similar or different patterns emerge. In addition, other dimensions in personality, such as dogmatism and self-monitoring should be tested jointly with cognitive styles to identify interactive relationships.

Further research could also investigate whether any systematic differences in decision making behavior (in the context of using analytical review results for auditing accounting estimates) exist between auditors in non-Big firms versus Big firms, and between firms that use a structured approach to decision making versus those that use an unstructured approach. This is because the training and the work environment are different in the two types of firms.

Since the scope of this study is limited to the audit work for public companies whose shares are traded, the replication of this study in the area of public sector is possible with some modification to the analytical review results variable to make it

appropriate to what auditors use in that sector. However, for the other variables, it is regarded as the same for both sectors. According to the psychology literature, personality traits (optimism) and cognitive complexity (vigilance) are characteristics of the person (auditor) and mostly are not affected by the work task.

REFERENCES

- Abbott, A., 1988. *The System of Professions: An Essay on the Division of Expert Labor*. Chicago: The University of Chicago Press.
- Abdel-Khalik, A.R. and Ajinkya, BB., 1979. *Empirical Research in Accounting: A Methodological Viewpoint*. American Accounting Association, Sarasota, Florida.
- Abdolmohammadi, M.J. and Wright, A., 1987. An Examination of the Effects of Experience and Task Complexity on Audit Judgements, *The Accounting Review*, 62, 1-13.
- Aly, H.F. and Duboff, J.I., 1971. Statistical vs. Judgmental Sampling: An Empirical Study of Auditing and Accounts Receivable of a Small Retail Store. *The Accounting Review*, January, 119-128.
- Ameen, E.C. and Strawser, J.R., 1994. Investigating the Use of Analytical Procedures: An Update and Extension, *Auditing: A Journal of Practice & Theory*, 13, 2, Fall, 69-76.
- American Institute of Certified Public Accountants (AICPA), 1983. Audit Risk and Materiality in Conducting an Audit, *Statement on Auditing Standards (SAS)* no. 47. New York: AICPA.
- American Institute of Certified Public Accountants (AICPA), 1988. Analytical Procedures, *Statement on Auditing Standards (SAS)* no. 56. New York: AICPA.
- American Institute of Certified Public Accountants (AICPA), 1988. Auditing Accounting Estimates. *Statement on Auditing Standards (SAS)* no. 57. New York: AICPA.
- Anderson, U., Koonce, L. and Marchant, G., 1991. A Model of Audit Judgment: Cognition in a Professional Context. In L.A. Ponemon and D.R.L. Gabhart(Eds.), *Auditing Advances in Behavioral Research*, 43-73. Springer-Verlag New York.
- Arens, A.A. and Loebbecke, J.K., 1991. *Auditing: An Integrated Approach*. Prentice Hall, Englewood Cliffs, New Jersey.
- Asare, S.K., and Davidson, R.A., 1995. Expectation of Errors in Unaudited Book Values: The Effect of Control Procedures and Financial Condition. *Auditing: A Journal of Practice & Theory*, 14, 1-18.
- Ashton, R.H., 1974. An Experimental Study of Internal Control Judgements. *Journal of Accounting Research*, Spring, 143-157.

- Ashton, R., 1982. *Human Information Processing in Accounting*, American Accounting Association.
- Ashton, R., 1983. *Research in Audit Decision Making: Rationale, Evidence, and Implications*. Research Monograph No. 6. Vancouver, Canada: Canadian Certified General Accountants' Research Foundation.
- Ashton, R.H. and Ashton, A.H., 1988. Sequential Belief Revision in Auditing. *The Accounting Review*, October, 623-641.
- Auerbach, S.M. and Gramling, S.E., 1998. *Stress Management: Psychological Foundations*, Prentice-Hall, Inc.
- Beaver, W.H., 1991. Commentary: Problems and Paradoxes in the Financial Reporting of Future Events. *Accounting Horizons*, December, 122-134.
- Benbasat, I and Dexter, A.S., 1979. Value and Events Approach to Accounting: An Experimental Evaluation. *The Accounting Review*, October, 735-749.
- Biggs, S.F. and Mock, T.J., 1983. An Investigation of Auditor Decision Processes in the Evaluation of Internal Controls and Audit Scope Decisions. *Journal of Accounting Research*, Spring, 234-255.
- Biggs, S.F., Mock, T.J. and Watkins, P.R., 1988. Auditor's Use of Analytical Review in Audit Program Design. *The Accounting Review*, LXIII, 148-161.
- Biggs, S.F. and Wild, J.J., 1985. An Investigation of Auditor Judgement in Analytical Review. *The Accounting Review*, LX, 607-633.
- Biggs, S.F., Mock, T.J. and Watkins, P.R., 1989. *Analytical Review Procedures and Processes in Auditing*. The Canadian Certified General Accountants' Research Foundation, Research Monograph Number 14.
- Blocher, E. and Cooper, J.C., 1988. A Study of the Predecisional Behavior of Auditors Performing Analytical Review. *Auditing: A Journal of Practice & Theory*, Spring.
- Blocher, E. and Loebbecke, J.K., 1993. Research in Analytical Procedures: Implications for Establishing and Implementing Auditing Standards, In *The Expectation Gap Standards*, American Institute of Certified Public Accountants, 177-226.
- Bonner, S.E. and Lewis, B.L., 1990. Determinants of Auditor Expertise, *Journal of Accounting Research*, Supplement, 1-20.
- Bonner, S.E. and Pennington, N., 1991. Cognitive Processes and Knowledge as Determinants of Auditor Expertise. *Journal of Accounting Literature*, 1-50.

- Bonner, S.E. and Walker, P.L., 1994. The Effects of Instruction and Experience on the Acquisition of Auditing Knowledge. *The Accounting Review*, 69, 1, January, 157-178.
- Boritz, J.E., Gaber, B.G. and Lemon, W.M., 1987. *An Experimental Study of Review of Preliminary Audit Strategy by External Auditors*. The Canadian Academic Accounting Association, Toronto.
- Butler, S.A., 1986. Anchoring in the Judgement Evaluation of Audit Samples. *The Accounting Review*, January, 101-111.
- Callahan, P.S., Jaenicke, H.R. and Neebes, D.L., 1988. SASs nos. 56 and 57: Increasing Audit Effectiveness. *Journal of Accountancy*, October, 56-68.
- Canadian Institute of Chartered Accountants, (CICA). *CICA Handbook*. Toronto, ON: CICA.
- Canadian Institute of Chartered Accountants (CICA), 1995. *Professional Judgment and The Auditor*. CICA Research Report, Toronto, ON: CICA.
- Carver, C.S. and Scheier, M.F., 1985. Self-Consciousness, Expectancies, and the Coping Process. In *Stress and Coping* T. Field, PM. McCabe and N. Schneiderrnan, eds., Hillsdale, NJ: E;lbaum, 305-330.
- Carver, C.S., Scheier, M.F. and Weintraub, J.K., 1989. Assessing Coping Strategies: A Theoretical Based Approach, *Journal of Personality and Social Psychology*, 56, 267-283.
- Chang, E.C., D'Zurilla, T.J. and Olivares, A.M., 1994. Assessing the Dimensionality of Optimism and Pessimism Using a Multimeasure Approach. *Cognitive Therapy and Research*, Vol. 18, 2, 143-160.
- Chen, Y. and Leitch, R.A., 1999. An Analysis of the Relative Power Characteristics of Analytical Procedures. *Auditing: A Journal of Practice & Theory*, 18, 2, Fall, 35-69.
- Cohen, J. and Kida, T., 1989. The Impact of Analytical Review Results, Internal Control Reliability, and Experience on Auditors' Use of Analytical Review. *Journal of Accounting Research*, 27, (Autumn), 263-276.
- Cohen, F. and Lazarus, R., 1979. Coping with stress of illness. In G. Stone, F. Cohen, N. Adler and Associates (Eds.), *Health Psychology: A handbook*. San Francisco: Jossey-Bass
- Coglitore, F. and Berryman, R.G., 1988. Analytical Procedures: A Defensive Necessity. *Auditing: A Journal of Practice and Theory*, Spring, 150-163.

- Daroca, F.P. and Holder, W.W., 1985. The Use of Analytical Procedures in Review and Audit Engagements. *Auditing: A Journal of Practice and Theory*, Spring,
- Davidson, R.A. and Gist, W.E., 1996. Empirical Evidence on the Functional Relation Between Audit Planning and Total Audit Effort. *Journal of Accounting Research*, 34, Spring, 111-124.
- Davies, D.R. and Parasuraman, R., 1981. *The Psychology of Vigilance*, Academic Press Inc. (London) Ltd.
- Davis, J.T., 1996. Experience and Auditors' Selection of Relevant Information for Preliminary Control Risk Assessment, *Auditing: A Journal of Practice and Theory*, 15, 1, Spring, 16-37.
- Dember, W.N., Martin, S., Hummer, M.K., Howe, S. and Melton, R., 1989. The Measurement of Optimism and Pessimism. *Current Psychology: Research and Review*, 8, 102-119.
- Dowie, J. and Elstein, A., 1988. *Professional Judgement: A Reader in Clinical Decision Making*. Cambridge, England: Cambridge University Press.
- Emby, C.E.N. and Gordon, I.M., 1993. *Audit Procedures and Techniques, Analytical Procedures: A Guide for Practitioners*. Certified General Accountants' Association of Canada, (CGA).
- Felix, W.L. and Kinney, W.R., 1982. Research in the Auditor's Opinion Formulation Process: State of the Art. *The Accounting Review*, April, 245-271.
- Folkman, S. and Lazarus, R.S., 1980. An Analysis of Coping in a Middle-Aged Community Sample, *Journal of Health and Social Behavior*, 21, Spring, 219-319.
- Folkman, S., Schetter, C.D., Delongis, A. and Gruen, R.J., 1985. Dynamics of a Stressful Encounter: Cognitive Appraisal, Coping and Encounter Outcomes. *Journal of Personality and Social Psychology*, 49, Winter, 992-1003.
- Folkman, S., Gruen, R.J. and Delongis, A., 1986. Appraisal, Coping, Health Status and Psychological Symptoms. *Journal of Personality and Social Psychology*, 50, Fall, 571-579.
- Fraser, I.A.M., Hatherly, D.J., and Lin, K.Z., 1997. An Empirical Investigation of the Use of Analytical Review by External Auditors, *British Accounting Review*, 29, 35-47.
- Frederick, D.M., 1991. Auditors' Representation and Retrieval of Internal Control Knowledge. *The Accounting Review*, 66, 2, April, 240-258.

- Gary, R., 1991. Evidence and Judgement. In M. Sherer and S. Turley (Eds.), *Current Issues in Auditing*, Second Edition, 131-143. Paul Chapman, London.
- Gibbins, M., 1984. Propositions about the Psychology of Professional Judgement in Public Accounting. *Journal of Accounting Research*, Spring, 103-125.
- Gibbins, M., 1977. *Human Inference, Heuristics and Auditors' Judgement Process* CICA Audit Research Symposium (Canadian Institute of Chartered Accountants).
- Gibbins, M. and Mason, A.K., 1988. *Professional Judgment in Financial Reporting*, Canadian Institute of Chartered Accountants.
- Gul, F.A., 1984. The Joint and Moderating Role of Personality and Cognitive Style on Decision Making, *The Accounting Review*, Vol. LIX, No. 2, 264-277.
- Hamilton, R. and Wright, W., 1982. Internal Control Judgements and Effects of Experience: Replication and Extensions. *Journal of Accounting Research*, Autumn, 756-765.
- Hartz, C. and Elrod, R., 1996. The Role of Optimism Assessment of Risk: A Second Look at Calibration of Probabilities. *Human Systems Management*, 15.
- Ho, J.L. and Rodgers, W., 1993. A Review of Accounting Research on Cognitive Characteristics. *Journal of Accounting Literature*, 12, 101-130.
- Hogarth, R.M. and Einhorn, H.J., 1992. Order Effects in Belief Updating: The Belief-Adjustment Model. *Cognitive Psychology*, 1-55.
- Holland, J., Holyoak, K., Nisbett, R. and Thagard, P., 1986. *Induction: Processes of Inference, Learning and Discovery*. Cambridge, MA: MIT Press.
- Holyoak, R. and Nisbett, R., 1988. Induction. In R. Sternberg and E. Smith (Eds.), *The Psychology of Human Thought*. pp. 50-91. Cambridge, England: Cambridge University Press.
- Hunton, J.E. and McEwen, R.A., 1997. An Assessment of the Relation Between Analysts' Earnings Forecast Accuracy, Motivational Incentives and Cognitive Information Search Strategy. *The Accounting Review*, 72, 4, October, 497-515.
- Hylas, R.E., and Ashton, R.H., 1982. Audit Detection of Financial Statement Errors. *The Accounting Review*, 57, 751-765.
- Janis, I.L. and Mann, L., 1977. *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment*, The Free Press: A Division of Macmillan Publishing Co., Inc.

- Janoff-Bulman, R., 1989. The benefits of illusions, the threat of disillusionment, and the limitations of accuracy, *Journal of Social and Clinical Psychology*, 8, 158-177.
- Johnson, R., 1988. Inherent and Control Risk Evaluations and the Identification of Account Balances Containing Material Errors. *Proceedings of the Sixth USC Audit Judgment Symposium*. University of Southern California, CA.
- Johnson, K.P. and Jaenicke, H.R., 1980. *Evaluating Internal Control: Concepts, Guidelines, Procedures, Documentation*. New York: Wiley.
- Joyce, E.J., 1976. Expert Judgement in Audit Program Planning. *Journal of Accounting Research*, Supplement, 29-60.
- Joyce, E.J. and Biddle, G.C., 1981a. Anchoring and Adjustment in Probabilistic Inference in Auditing. *Journal of Accounting Research*, Spring, 120-145.
- Joyce, E.J. and Biddle, G.C., 1981b. Are Auditors' Judgements Sufficiently Regressive? *Journal of Accounting Research*, Autumn, 323-349.
- Kahn, R.L., Wolfe, D.M., Quinn, R.P., Snoek, J.D. and Rosenthal, R.A., 1964. *Organizational stress: Studies in role conflict and ambiguity*, New York: Wiley.
- Kaplan, S. and Reckers, P.M.J., 1995. Auditors' Reporting Decisions for Accounting Estimates: the effect of assessments of the risk of fraudulent financial reporting. *Managerial Auditing Journal*, 10, 27-36.
- Keenan, D., 1979. Evidence and the Auditor, *Accountancy*, August, 96-97.
- Keenan, D. and Anderson, J., 1979. Evidence and the Auditor (part 2), *Accountancy*, September, 119-120.
- Kennedy, J., 1993. Debiasing Audit Judgement with Accountability: A Framework and Experimental Results. *Journal of Accounting Research*, Autumn, 231-245.
- Kida, T., 1984. The Impact of Hypothesis-Testing Strategies on Auditors' Use of Judgment Data. *Journal of Accounting Research*. Spring, 332-340.
- Kinney, W., 1981. Predicting Auditor-Initiated Adjustments Using Paired-Balance Method. *Accounting, Auditing and Finance*, Fall, 5-17.
- Kinney, W.R. and Haynes, C.M., 1990. *Analytical Procedure Results as a Substantive Evidence*, University of Kansas Auditing Symposium, Lawrence, KS: Deloitte & Touche, 5-18.
- Kinney, W.R. and Uecker, W.C., 1982. Mitigating the Consequences of Anchoring in Auditor Judgements. *The Accounting Review*, January, 55-69.

- Knechel, W.R., 1988. The Effectiveness of Analytical Review as a Substantive Auditing Procedure: A Simulation Analysis. *The Accounting Review*, January,
- Kreutzfeldt, R.W. and Wallace, W.A., 1986. Error Characteristics in Audit Populations: Their Profile and Relationship to Environmental Factors. *Auditing: A Journal of Practice & Theory*, 6, Fall, 20-43.
- Lazarus, R.S. and Folkman, S., 1984. *Stress, Appraisal, and Coping*, Springer Publishing Company, Inc.
- Lee, C., Ashford, S.J. and Jamieson, L.F., 1993. The Effects of Type A Behavior Dimensions and Optimism on Coping Strategy, Health, and Performance, *Journal of Organizational Behavior*, Vol. 14, 143-157.
- Libby, R., 1981. *Human Information Processing: Theory and Applications*, Prentice-Hall.
- Libby, R., 1985. Availability and the Generation of Hypotheses in Analytical Review. *Journal of Accounting Research*. 23, Autumn, 648-667.
- Libby, R., 1993. The Role of Knowledge and Memory in Audit Judgement. In *Judgement and Decision Making Research in Accounting and Auditing*, edited by R.H. Ashton and A.H. Ashton, Cambridge, MA: Cambridge University Press
- Libby, R. and Lewis, B., 1977. Human Information Processing Research in Accounting: The State of Art, *Accounting, Organization and Society*, No. 3, 245-268.
- Libby, R. and Luft, J., 1993. Determinants of Judgement Performance in Accounting Settings: Ability, Knowledge, Motivation, and Environment. *Accounting, Organization and Society*, 425--450
- Loebbecke, J.K. and Steinbart, P.J., 1987. An Investigation of the Use of Preliminary Analytical Review to Provide Substantive Audit Evidence. *Auditing: A Journal of Practice and Theory*, Spring, 74-89.
- Loomis, H.K. and Moskowitz, S., 1958. Cognitive Style and Stimulus Ambiguity, *Journal of Personality*, March, 349-364.
- Mackworth, N.H., 1957. Some factors affecting vigilance, *Advancement of Science*, 53, 389-393.
- Mahathevan, P., 1997. Auditors' Use and Perception of Analytical Procedures: Evidence from Singapore, *International Journal of Auditing*, 1, 3, 225-239.

- Mann, L., Burnett, P., Radford, M. and Ford, S., 1997. The Melbourne Decision Making Questionnaire: An Instrument for Measuring Patterns for Coping with Decisional Conflict. *Journal of Behavioral Decision Making*, Vol. 10, 1-19.
- Mautz, R.K., 1975. Some Observations on Auditing Research. *Journal of Accountancy*, October, 92-96.
- McGhee, W., Shields, M.D. and Birnberg, J.G., 1978. The Effects of Personality on a Subject's Information Processing, *The Accounting Review*, Vol. LIII, No. 3 681-697.
- Messier, W.F., Jr., and Tubbs, R., 1994. Mitigating Recency Effects in Belief Revision: The Impact of Audit Experience and the Review Process. *Auditing: A Journal of Practice and Theory*, Spring, 57-72.
- Mischel, W., 1973. Toward a Cognitive Social Learning Reconceptualization of Personality, *Psychological Review*, July, 252-283.
- Mischel, W., 1979. On the Interface of Cognition and Personality, *American Psychologist*, September, 740-754.
- Mock, T. and Wright, A., 1982. Evaluating the Effectiveness of Audit Procedures. *Auditing: A Journal of Practice & Theory*. 2(Fall), 33-43.
- Peters, J., 1990. A Cognitive Computational Model of Risk Hypothesis Generation. *Journal of Accounting Research*. 28, (Supplement), 83-103.
- Peters, J., Lewis, B. and Dhar, V., 1989. Assessing Inherent Risk During Audit Planning: The Development of Knowledge Based Model. *Accounting, Organization and Society*. 14, June, 359-378.
- Pincus, K.V., 1990. Auditor Individual Differences and Fairness of Presentation Judgments, *Auditing: A Journal of Practice & Theory*, Vol. 9, No. 3, Fall, 150-166.
- Pratt, J., 1980. The Effects of Personality on Subject's Information Processing: A Comment, *The Accounting Review*, July, 501-506.
- Ramos, M.J. and Delahanty, L.C., 1998. *Auditing Estimates and Other Soft Accounting Information*. American Institute of Certified Public Accountants, Inc., New York, NY.
- Rebele, J.E., Heinz, J.S. and Briden, G.E., 1988. Independent Auditor Sensitivity to Reliability. *Auditing: A journal of Practice and Theory*, Fall, 43-52.

- Reneau, J.H., 1991. Evidence Selection Strategies for Auditors: The Role of Predictive Rule for Error in Analytical Procedures. *Applications of Management Science*, 95-111
- Rowe, A.J. and Mason, R.O., 1987. *Managing With Style*. Jossey-Bass Inc., Publishers.
- Scheier, M.F. and Carver, C.S., 1985. Optimism, Coping, and Health: Assessment and Implications of Generalized Outcome Expectancies, *Health Psychology*, Vol. 4, No. 3, 219-247.
- Scheier, M.F. and Carver, C.S., 1987. Dispositional Optimism and Physical Well-Being: the Influence of Generalized Outcome Expectancies on Health, *Journal of Personality*, 55, 169-210.
- Scheier, M.F. and Carver, C.S., 1992. Effects of Optimism on Psychological and Physical Well-Being: Theoretical Overview and Empirical Update, *Cognitive Therapy and Research*, 16, 201- 228.
- Scheier, M.F., Matthews, K.A., Owens, J.F., Magovern, G.J., Lefebvre, R.C., Abbott, R.A. and Carver, C.S., 1989. Dispositional Optimism and Recovery from Coronary Artery Bypass Surgery: The Beneficial Effects on Physical and Psychological Well-Being, *Journal of Personality and Social Psychology*, 57, 1024-1040.
- Scheier, M.F., Weintraub, J.K. and Carver, C.S., 1986. Coping with Stress: Divergent Strategies of Optimists and Pessimists, *Journal of Personality and Social Psychology*, 51, 1257-1264.
- Scott, D.A. and Wallace, W.A., 1994. Analytical Procedures. *The CPA Journal*, December, 64-65.
- Seale, D.A., Rapoport, A. and Budescu, D.V., 1995. Decision Making under Strict Uncertainty: An Experimental Test of Competitive Criteria, *Organizational Behavior and Human Decision Processes*, Vol. 64, No. 1, October, 65-75.
- Seligman, M.E.P., 1991. *Learned optimism*, New York: Alfred A. Knopf.
- Shapiro, D., 1965. *Neurotic styles*. New York: Basic Books.
- Smith, D.G., 1983. *Analytical Review*. CICA, Toronto.
- Smith, S., 1994. A Matter of Evidence. *CA Magazine*, October, 57-58.
- Smith, J.F. and Kida, T., 1991. Heuristic and Biases: Expertise and Task Realism in Auditing. *Psychological Bulletin*, 472-489.

- Solomon, I. and Shields, M.D., 1994. Judgement and Decision Making in Auditing. *Judgement and Decision Research in Accounting and Auditing*, R.H. Ashton and A.H. Ashton, eds. New York: Cambridge University Press.
- Stamp, E., 1981. Why Can Accounting Not Become a Science Like Physics? *Abacus*, 17, 13-27.
- Tabor, R. and Willis, J., 1985. Empirical Evidence on the Changing Role of Analytical Review Procedures. *Auditing: A Journal of Practice and Theory*, Spring, 93-109.
- Trotman, K.T. and Wood, R., 1991. A Meta-Analysis of Studies on Internal Control Judgements. *Journal of Accounting Research*, Spring, 180-192.
- Tubbs, R., Messier, W.F. and Knechel, W.R., 1990. Recency Effects in the Auditors Belief Revision Process. *The Accounting Review*, April, 452-460.
- Tversky, A. and Kahneman, D., 1982. Judgment Under Uncertainty: Heuristics and Biased. In D. Kahneman, P. Slovic and A. Tversky (Eds.), *Judgment Under Uncertainty: Heuristics and Biases*, 3-20. Cambridge University Press.
- Uecker, W. and Kinney, W., 1977. Judgemental Evaluation of Sample Results: A Study of the Type and Severity of Errors made by Practicing CPA's. *Accounting, Organizations, and Society*, 3, 269-275.
- Wallace, W.A., 1993. Auditing Complex Accounting Estimates. In *The Expectation Gap Standards*, American Institute of Certified Public Accountants, 125-176.
- Willingham, J., 1985. *Presentation at USC Symposium on Audit Risk*. February.
- Wright, A. and Ashton, R.H., 1989. Identifying Audit Adjustments with Attention-Directing procedures. *The Accounting Review*, October, 710-728.
- Wright, A. and Mock, T.J., 1988. Auditor Evidential Planning Judgments. In R.P. Srivastava and J.E. Rebele (Eds.), *Auditing Symposium IX*, 101-114. School of Business, University of Kansas, Lawrence, Kansas.
- Yates, F.J., 1990. *Judgement and Decision Making*. Englewood Cliffs, NJ: Prentice Hall.

APPENDIX 1

CASE MATERIAL FOR TREATMENT GROUP ANALYTICAL REVIEW RESULTS SIGNALLING NO-FLUCTUATIONS

Dear Participant

This letter is to solicit your participation in a study about audit planning hours, which is carried out by Mr. Balkir, a doctoral candidate in accounting at Concordia, in partial fulfillment of the requirements for his doctoral program.

The experimental task requires the participant to evaluate an audit setting and judge if a revision in audit planning hours is warranted by the information provided in the case. We realize that you are very busy during this time of the year and that you are carefully managing the continuous pressure on your valuable time. Nevertheless, we invite you to participate in this task and appreciate your effort to devote about 30 minutes of your time to complete the attached instrument and return it to us in the enclosed self addressed envelop.

Please note that the task instrument is anonymous and does not require a personal identification of the participant or his/her firm. In addition, we will not analyze or publish individual responses. We will aggregate all responses for statistical analysis and only the summarized results will be reported and published.

We hope that you will accept our invitation to participate in this study and look forward to receiving your response within the coming four weeks.

Thank you in advance for your cooperation.

Sincerely

M. Ibrahim, Ph.D.
Professor of Accounting &
Thesis Supervisor

General Information

The XYZ is a medium sized publicly traded (TSE) corporation founded in 1956. The firm manufactures a variety of large and small products for industrial application. The diverse nature of the business is a result of two mergers that occurred in the early 1970s.

In the past the audit engagement has seldom produced major auditor/client disagreements. The immediate past partner in charge of the XYZ audit was rotated to another assignment. After consulting prior years' audit files and general discussion with management, the partner in charge prepared the following budgeted time for the planned audit procedures for three accounts:

<u>The Account</u>	<u>Hours</u>
Obsolete inventory (allowance)	5
Allowance for doubtful accounts (bad debts expense)	4
Depreciation for fixed assets (useful lives)	4

On the following pages, you are provided with audited financial statements of the last two years (1996, 1997), unaudited financial statements of the current year (1998) and the analytical review results (selected ratios) which were prepared by one of your seniors.

Your task is to judge the need to modify the initial audit plan (hours) based on the information provided (financial statements, analytical review results).

Please proceed at your own pace. **Note that your participation in this study is on a voluntary basis.** Once you have completed the exercise, please return the case material in the attached self addressed envelop.

XYZ Corporation
Income Statement Year Ended December 31
(in \$' 000s)

	1998	<i>%CH</i> <i>96:98</i>	Audited 1997	<i>%CH</i> <i>96:97</i>	Audited 1996
Sales	598,733	<i>-0.07</i>	601,456	<i>-0.06</i>	645,172
Cost of Sales	<u>539,299</u>	<i>-0.07</i>	<u>545,462</u>	<i>-0.06</i>	<u>581,672</u>
Gross Margin	59,434	<i>-0.06</i>	55,994	<i>-0.12</i>	63,500
Selling & Admin.	30,462	<i>-0.16</i>	31,699	<i>-0.13</i>	36,298
Other Expenses	8,650	<i>0.12</i>	4,859	<i>-0.37</i>	7,725
Income Taxes	7,316	<i>0.08</i>	6,909	<i>0.02</i>	6,777
Net Income	<u><u>13,006</u></u>	<i>0.02</i>	<u><u>12,527</u></u>	<i>-0.02</i>	<u><u>12,700</u></u>

XYZ Corporation
Balance Sheet as of December 31
(in \$' 000s)

	1998	%CH 96:98	Audited 1997	%CH 96:97	Audited 1996
Cash and Securities	6,842	-0.02	5,213	-0.26	7,005
Net Receivables	85,485	-0.04	86,204	-0.03	88,933
Inventories	110,550	-0.08	111,418	-0.07	119,875
Other Current Assets	22,743	0.15	22,242	0.12	19,836
Total Current Assets	225,620	-0.04	225,077	-0.05	235,649
Long-Term Assets	411,453	-0.18	440,869	-0.12	501,273
Total Assets	<u>637,073</u>	-0.14	<u>665,946</u>	-0.1	<u>736,922</u>
Short-Term Liabilities	138,790	-0.06	142,453	-0.03	147,030
Long-Term Liabilities	301,783	-0.15	318,406	-0.1	353,973
Stockholders' Equity	196,500	-0.17	205,087	-0.13	235,919
Total Liabilities & Equity	<u>637,073</u>	-0.14	<u>665,946</u>	-0.1	<u>736,922</u>

Notes on Accounting Estimates Assertions

(1) **Allowance for obsolete inventory.** In determining the allowance for obsolete inventory in the Electronic Controls Division, it was noted that available catalogues list some items at prices that are 15 per cent below XYZ costs of comparable manufactured items. Management believes that quoted catalogue prices are reliable and the competition is taking orders at those figures. Therefore management estimates the amount of inventory **write-offs** to be **(\$14,000,600)**.

(2) **Allowance for bad debts.** Although some new changes in credit policy have taken place this year, management still applies previous rates which were found stable within the firm over the past years. Thus, the client's bad debt expense figure is **(\$14,968,325)**.

(3) **Depreciation of equipment.** The client revised the estimated useful live of most depreciable manufacturing equipment in the audio-electronics division and optical-electronics division this period. Generally, the estimates were increased by 10 per cent. The client argues that the equipment in question is fundamentally subject only to physical deterioration and not technical obsolescence. Further, the client cites the adoption of a new maintenance policy that will extend the physical live of the equipment. These changes result in a **decrease** in pre-audit depreciation expense by **(\$2,900,000)**.

Analytical Review Results

Selected Ratios:

	1998	<u>Audited</u> 1997	1996	<u>(1998)</u> Industry
Current Ratio	1.62	1.58	1.60	1.58
(Current Assets/Current Liabilities)				
Quick Ratio	0.66	0.64	0.65	0.75
(Cash+Acc. Rec./Current Liabilities)				
Debt/Owners' Equity	1.53	1.55	1.50	1.61
Net Profits/Sales %	2.17	2.10	2.00	2.58
Inventory Turnover (Sales/Inventory)	5.42	5.40	5.38	5.70
Average Collection Period (Acc. Rec./Sales)365	52	53	50	51

Further Notes:

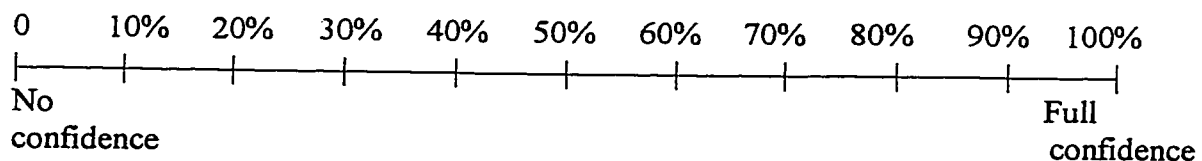
	1998	1997	1996
Allowance for Bad Debts as a percentage of sales	<i>(2.5% of Sales)</i> 14,968,325	<i>(2.5% of Sales)</i> 15,036,400	<i>(2.5% of Sales)</i> 16,129,300
Depreciation for Fixed Assets	<i>(Useful Live 9 Years)</i> 50,086,900	<i>(U.L. 8 Years)</i> 62,659,125	<i>(U.L. 8 Years)</i> 70,491,515

Instructions

As an auditor in charge of this year's audit engagement, and based on the information provided (financial statements and analytical review results), do you think the initial budgeted time for the planned audit procedures needs to be modified? If so, please fill in the revised budgeted time for each of the three accounts listed below.

<u>The Account</u>	<u>Initial Budgeted Time (Hours)</u>	<u>Revised Budgeted Time (Hours)</u>
Obsolete inventory (allowance)	5
Allowance for doubtful accounts (bad debts expense)	4
Depreciation for fixed assets (useful lives)	4

Please indicate on the scale below your level of confidence in the revised budgeted time.



Please indicate your level of audit experience

☐ Less than 3 years.

☐ Three years or more.

Please indicate your gender

☐ Female

☐ Male

Life Orientation Test Instrument for Measuring Optimism

Please indicate the extent to which you agree with each of the following items using the scale below: 4=*strongly agree* 3=*agree* 2=*neutral* 1=*disagree* and 0=*strongly disagree*

1. In uncertain times, I usually expect the best.	0	1	2	3	4
	----- ----- ----- -----				
	<i>Strongly disagree</i>			<i>Strongly agree</i>	
2. It's easy for me to relax.	0	1	2	3	4
3. If something can go wrong for me, it will.	0	1	2	3	4
4. I always look on the bright side of things.	0	1	2	3	4
5. I m always optimistic about my future.	0	1	2	3	4
6. I enjoy my friends a lot.	0	1	2	3	4
7. It's important for me to keep busy.	0	1	2	3	4
8. I hardly ever expect things to go my way.	0	1	2	3	4
9. Things never work out the way I want them to.	0	1	2	3	4
10. I don't get upset too easily.	0	1	2	3	4
11. I m a believer in the idea that “every cloud has a silver lining.”	0	1	2	3	4
12. I rarely count on good things happening to me.	0	1	2	3	4

Melbourne Decision Making Questionnaire for Measuring Vigilance

Please indicate the extent to which you consider each of the following items to be “*true for you*” when you are faced with a particular issue in your life by encircling the appropriate number using the scale provided.

- | | | | | | | | | | | | |
|----|---------------------------------------------------------------|------------------------|---|---|---|---|---|--------------------|---|---|----|
| 1. | I like to consider all of the alternatives. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | — | | — | | — | | — | | — |
| | | <i>Not true for me</i> | | | | | | <i>True for me</i> | | | |
| | | | | | | | | | | | |
| 2. | I try to find out the disadvantages of all alternatives. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | | |
| 3. | I consider how best to carry out a decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | | |
| 4. | When making decisions I like to collect a lot of information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | | |
| 5. | I try to be clear about my objectives before choosing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | | |
| 6. | I take a lot of care before choosing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

APPENDIX 2

CASE MATERIAL FOR TREATMENT GROUP ANALYTICAL REVIEW RESULTS SIGNALLING FLUCTUATIONS

Dear Participant

This letter is to solicit your participation in a study about audit planning hours, which is carried out by Mr. Balkir, a doctoral candidate in accounting at Concordia, in partial fulfillment of the requirements for his doctoral program.

The experimental task requires the participant to evaluate an audit setting and judge if a revision in audit planning hours is warranted by the information provided in the case. We realize that you are very busy during this time of the year and that you are carefully managing the continuous pressure on your valuable time. Nevertheless, we invite you to participate in this task and appreciate your effort to devote about 30 minutes of your time to complete the attached instrument and return it to us in the enclosed self addressed envelop.

Please note that the task instrument is anonymous and does not require a personal identification of the participant or his/her firm. In addition, we will not analyze or publish individual responses. We will aggregate all responses for statistical analysis and only the summarized results will be reported and published.

We hope that you will accept our invitation to participate in this study and look forward to receiving your response within the coming four weeks.

Thank you in advance for your cooperation.

Sincerely

M. Ibrahim, Ph.D.
Professor of Accounting &
Thesis Supervisor

General Information

The XYZ is a medium sized publicly traded (TSE) corporation founded in 1956. The firm manufactures a variety of large and small products for industrial application. The diverse nature of the business is a result of two mergers that occurred in the early 1970s.

In the past the audit engagement has seldom produced major auditor/client disagreements. The immediate past partner in charge of the XYZ audit was rotated to another assignment. After consulting prior years' audit files and general discussion with management, the partner in charge prepared the following budgeted time for the planned audit procedures for three accounts:

<u>The Account</u>	<u>Hours</u>
Obsolete inventory (allowance)	5
Allowance for doubtful accounts (bad debts expense)	4
Depreciation for fixed assets (useful lives)	4

On the following pages, you are provided with audited financial statements of the last two years (1996, 1997), unaudited financial statements of the current year (1998) and the analytical review results (selected ratios) which were prepared by one of your seniors.

Your task is to judge the need to modify the initial audit plan (hours) based on the information provided (financial statements, analytical review results).

Please proceed at your own pace. **Note that your participation in this study is on a voluntary basis.** Once you have completed the exercise, please return the case material in the attached self addressed envelop.

XYZ Corporation
Income Statement Year Ended December 31
(in \$' 000s)

	1998	%CH 96:98	Audited 1997	%CH 96:97	Audited 1996
Sales	592,733	-0.08	601,456	-0.06	645,172
Cost of Sales	<u>531,513</u>	-0.09	<u>545,462</u>	-0.06	<u>581,672</u>
Gross Margin	61,220	-0.04	55,994	-0.12	63,500
Selling & Admin.	30,462	-0.16	31,699	-0.13	36,298
Other Expenses	5,650	-0.27	4,859	-0.37	7,725
Income Taxes	9,316	0.37	6,909	0.02	6,777
Net Income	<u><u>15,792</u></u>	0.24	<u><u>12,527</u></u>	-0.02	<u><u>12,700</u></u>

XYZ Corporation
Balance Sheet as of December 31
(in \$' 000s)

	1998	<i>%CH</i> <i>96:98</i>	Audited 1997	<i>%CH</i> <i>96:97</i>	Audited 1996
Cash and Securities	8,842	<i>0.26</i>	5,213	<i>-0.26</i>	7,005
Net Receivables	100,683	<i>0.13</i>	86,204	<i>-0.03</i>	88,933
Inventories	130,000	<i>0.09</i>	111,418	<i>-0.07</i>	119,875
Other Current Assets	10,343	<i>-0.48</i>	22,242	<i>0.12</i>	19,836
Total Current Assets	249,868	<i>0.06</i>	225,077	<i>-0.05</i>	235,649
Long-Term Assets	414,308	<i>-0.17</i>	440,869	<i>-0.12</i>	501,273
Total Assets	<u>664,176</u>	<i>-0.1</i>	<u>665,946</u>	<i>-0.1</i>	<u>736,922</u>
Short-Term Liabilities	138,790	<i>-0.06</i>	142,453	<i>-0.03</i>	147,030
Long-Term Liabilities	343,886	<i>-0.03</i>	318,406	<i>-0.1</i>	353,973
Stockholders' Equity	181,500	<i>-0.23</i>	205,087	<i>-0.13</i>	235,919
Total Liabilities & Equity	<u>664,176</u>	<i>-0.1</i>	<u>665,946</u>	<i>-0.1</i>	<u>736,922</u>

Notes on Accounting Estimates Assertions

(1) **Allowance for obsolete inventory.** The firm continues to use full cost to set the price for a whole line of control devices. Similar devices are being produced by a competing manufacturer. Available catalogues list these items at prices that are 15 per cent below XYZ costs of comparable manufactured items. The Electronic Controls Division argues that this is likely to be only a short-term price-cutting marketing campaign by this newly incorporated competitor and sees no need to adjust inventory values at this time. The division plans to incorporate similar new technology in the coming few months. If necessary the division will market the "old" controls in developing nations. Conditions are too uncertain, argues XYZ, to make meaningful projections at this time. The firm will be willing to make write-downs next year when and if more reliable information is available. This policy affected (**overstated**) the inventory value of this year by **(\$14,000,600)**.

(2) **Allowance for bad debts.** The client has adopted this year a new percentage figure to calculate bad debts expense and the related allowance. The rate is significantly below that experienced and applied over the last five years. The client insists that the new rate is within a published average range provided in industry association literature and that the figure is more appropriate than earlier historical data from within the firm because of a changed environment. The client notes that it has changed its credit-granting policy during the year and therefore the old data are especially unsuitable. The client's bad debt expense figure of this year is **less** than the figure that would have been calculated from the old data by **(\$4,973,000)**.

(3) **Depreciation of equipment.** The client revised the estimated useful live of most depreciable manufacturing equipment in the audio-electronics division and optical-electronics division this period. Generally, the estimates were increased by 20 per cent. The client argues that the equipment in question is fundamentally subject only to physical deterioration and not technical obsolescence. Further, the client cites the adoption of a new maintenance policy that will extend the physical live of the equipment. These changes result in a **decrease** in pre-audit depreciation expense by **(\$5,800,000)**.

Analytical Review Results

Selected Ratios:

	1998	<u>Audited</u> 1997	1996	<u>(1998)</u> Industry
Current Ratio	1.80	1.58	1.60	1.58
(Current Assets/Current Liabilities)				
Quick Ratio	0.79	0.64	0.65	0.75
(Cash+Acc. Rec./Current Liabilities)				
Debt/Owners' Equity	1.90	1.55	1.50	1.61
Net Profits/Sales %	2.60	2.10	2.00	2.58
Inventory Turnover	4.56	5.40	5.38	5.70
(Sales/Inventory)				
Average Collection Period	62	53	50	51
(Acc. Rec./Sales)365				

Further Notes:

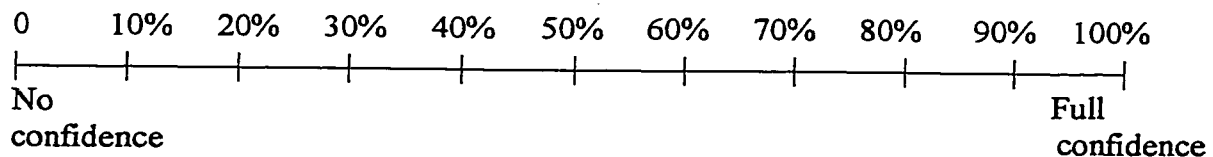
	1998	1997	1996
Allowance for Bad Debts	<i>(1.75% of Sales)</i>	<i>(2.5% of Sales)</i>	<i>(2.5% of Sales)</i>
as a percentage of sales	10,372,828	15,036,400	16,129,300
Depreciation for Fixed Assets	<i>(Useful Live 10 Years)</i>	<i>(U.L. 8 Years)</i>	<i>(U.L. 8 Years)</i>
	44,086,900	62,659,125	70,491,515

Instructions

As an auditor in charge of this year's audit engagement, and based on the information provided (financial statements and analytical review results), do you think the initial budgeted time for the planned audit procedures needs to be modified? If so, please fill in the revised budgeted time for each of the three accounts listed below.

<u>The Account</u>	<u>Initial Budgeted Time (Hours)</u>	<u>Revised Budgeted Time (Hours)</u>
Obsolete inventory (allowance)	5
Allowance for doubtful accounts (bad debts expense)	4
Depreciation for fixed assets (useful lives)	4

Please indicate on the scale below your level of confidence in the revised budgeted time.



Please indicate your level of audit experience

☐ Less than 3 years.

☐ Three years or more.

Please indicate your gender

☐ Female

☐ Male

Life Orientation Test Instrument for Measuring Optimism

Please indicate the extent to which you agree with each of the following items using the scale below: 4=*strongly agree* 3=*agree* 2=*neutral* 1=*disagree* and 0=*strongly disagree*

1. In uncertain times, I usually expect the best.	0	1	2	3	4
	----- ----- ----- -----				
	<i>Strongly disagree</i>			<i>Strongly agree</i>	
2. It's easy for me to relax.	0	1	2	3	4
3. If something can go wrong for me, it will.	0	1	2	3	4
4. I always look on the bright side of things.	0	1	2	3	4
5. I m always optimistic about my future.	0	1	2	3	4
6. I enjoy my friends a lot.	0	1	2	3	4
7. It's important for me to keep busy.	0	1	2	3	4
8. I hardly ever expect things to go my way.	0	1	2	3	4
9. Things never work out the way I want them to.	0	1	2	3	4
10 I don't get upset too easily.	0	1	2	3	4
11. I m a believer in the idea that "every cloud has a silver lining."	0	1	2	3	4
12. I rarely count on good things happening to me.	0	1	2	3	4

Melbourne Decision Making Questionnaire for Measuring Vigilance

Please indicate the extent to which you consider each of the following items to be “*true for you*” when you are faced with a particular issue in your life by encircling the appropriate number using the scale provided.

- | | | | | | | | | | | |
|------------------------------------------------------------------|------------------------|---|---|---|---|--------------------|---|---|---|----|
| 1. I like to consider all of the alternatives. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | — | — | — | — | — | — | — | — | — | — |
| | <i>Not true for me</i> | | | | | <i>True for me</i> | | | | |
| | | | | | | | | | | |
| 2. I try to find out the disadvantages of all alternatives. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | |
| 3. I consider how best to carry out a decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | |
| 4. When making decisions I like to collect a lot of information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | |
| 5. I try to be clear about my objectives before choosing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | | |
| 6. I take a lot of care before choosing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |